Special Issue May 24, 1956

# The IRON AGE

The National Metalworking Weekly

## More for Your Handling Dollar

SEE PAGE 149

Digest of the Week P–2

A
ROTOR
When a manufacturer of hydraulic pumps switched from 8620 steel to Copperweld 8620 Leaded Steel, the life of a set of tools was increased 33⅓% from 7200 pieces to 9600 pieces.
A
Q
KNOCKOUT PUNCH
When the Greenlee Tool Company switched to a Copperweld Leaded Alloy for this knockout punch, their spindle RPM on operations involving turning, drilling, milling and grinding increased 30%, and their tool feed from .005" IPR to .009" IPR.
Q
GEAR
This complex gear, part of the gear assembly for The Frank G. Hough Company's "Payloader," is made in 6 separate operations or set-ups with a tooling sequence of 13 operations. When they switched from unleaded steel to Copperweld Leaded 8620, the faster feeds and speeds gave them a production increase of better than 25%. In addition, tool life increased 60%.
K

## It's in the cards to save time and money with

# COPPERWELD LEADED ALLOYS

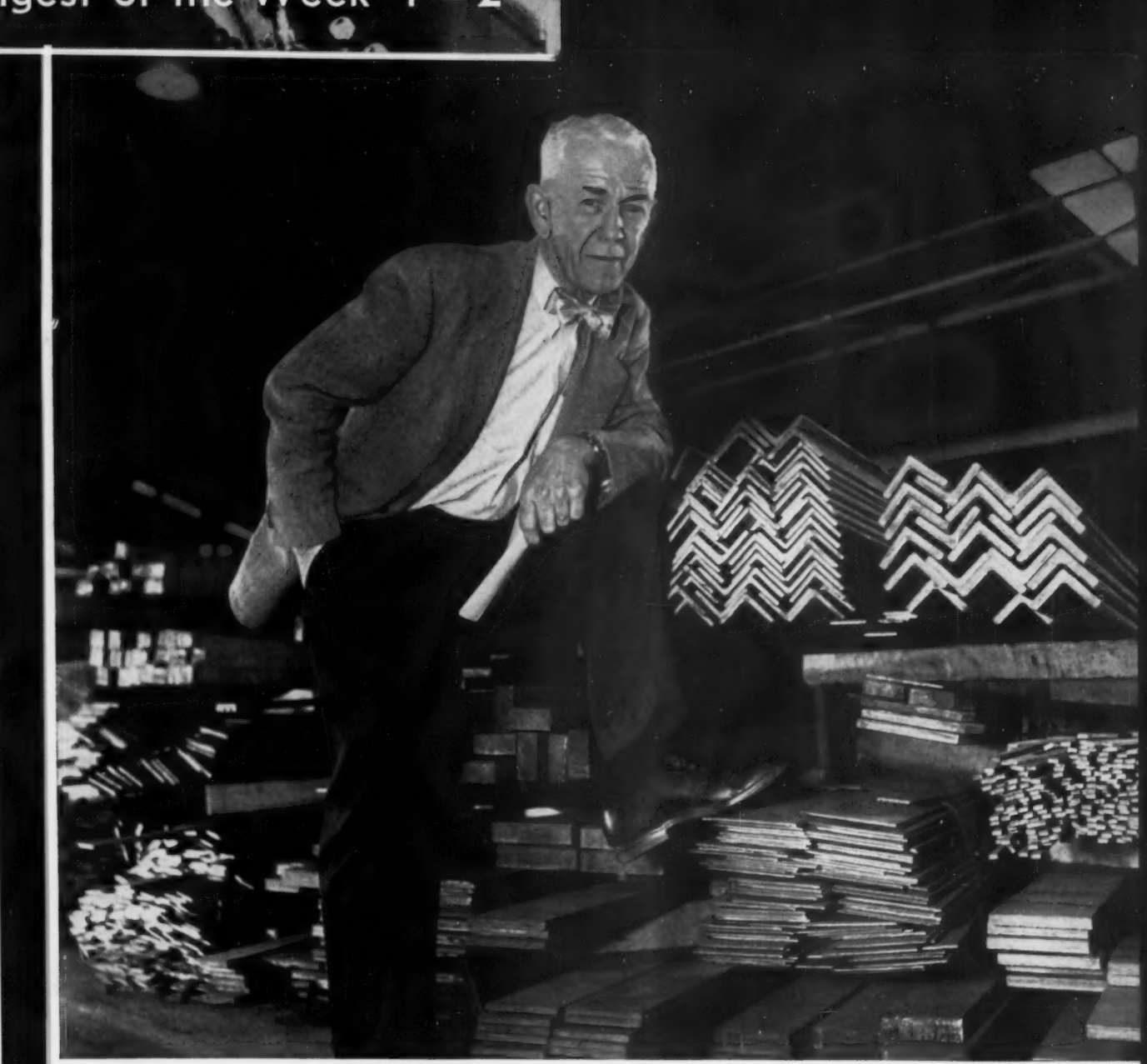
ARISTOLOY STEELS

Case after case where manufacturers use Copperweld Leaded Alloy Steels—the steels with "built-in productivity"—substantial savings are realized. When your problem is quality work in quantity production, leaded steels give faster feeds and speeds and their machinability can increase tool life 60%.

*Write for free booklet, "Lead Treated Steels."*

**COPPERWELD STEEL COMPANY • STEEL DIVISION • WARREN, OHIO**

**EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.**



# He keeps large inventories—so that you don't have to!

Users of steel know that maintenance of inventory can often be a costly headache. It ties up capital and space. It usually requires expensive equipment for the handling and processing of stock. It increases insurance costs, and necessitates additional clerical and storeroom help.

What's the best answer? For the buyer of steel in small and moderate lots, the answer is a simple one. He can so easily get his supplies from the "warehouseman"—the local distributor of steel products!

A great many of these distributors throughout the country handle Bethlehem products. They keep big inventories—sheets, strip, bars, plates, structurals, tool steel, rod and wire, hardware, and other items. They maintain these extensive inventories so that you, the buyer, won't have to. They're in business to supply you with steel, and their purpose is to have what you want at all times.

They're equipped for service, too—for shearing, edging, slitting, flame-cutting, sawing, and other operations that "tailor" the steel. And many of these firms can give you expert technical advice and even laboratory help.

If you are beset by problems involving steel, you'll often find help at the nearest Bethlehem distributor's. Give him a ring, whether your order is large or small; you'll find him cooperative, friendly, and always geared for fast delivery.

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*Call the distributor—your Shopping Center for Steel*

DIGEST OF THE WEEK IN METALWORKING

May 24, 1956—Vol. 177, No. 21

The IRON AGE

# Digest of the Week in Metalworking

**Starred items are digested at right.**


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**Chestnut and 56th Sts. Philadelphia 39, Pa.**

## NEWS DEVELOPMENTS

**WHAT HAPPENS IN DETROIT WHEN SUB STARTS?** P. 99

Rumblings are going on before first payment. High layoff rate before re-

serve fund is built up keeps payments at only a few weeks. Some UAW members always believed that the 5¢ per hour would have been better in paychecks. But principle is established even if first SUB isn't quite what was hoped for.

**STEEL: UNION PRICE TAG IS HIGH** P. 101

Steel labor is set to fight for a whopping settlement; steel industry's set to concede considerably less. Unless demands are pared, there will be trouble. Issues include premium weekend pay, other fringes.

**PRIVATE INDUSTRY PROGRESSES WITH ATOMS** P. 104

Babcock & Wilcox opens first private plant for nuclear fuel element fabricating. Fuel element fabricating cuts across almost every area of metalworking. It's expensive work and still presents many problems, but B & W has cut costs, speeded processing.

**DESIGN ENGINEERS STAGE FIRST SHOW** P. 107

Hundreds of new products, many in the metalworking field, got critical appraisal as initial Design Engineering Show was held. Trend to miniaturization and need for better control of designing costs were among features.

SYSTEMATIZED approach to today's material handling problems is typified by radio equipped, centrally dispatched industrial truck fleets like this. See special feature P. 149. (Chrysler Photo.)

**FIGHT RAGES OVER SCRAP EXPORT POLICIES** P. 109

Adm. Moreell and E. T. Weir take off on uncontrolled exports. Scrap industry counters, says scrap is not short, that mills aren't buying. Government plans to study essentiality of scrap, will include copper and aluminum as well as ferrous. Administration not likely to act.

## SPECIAL FEATURES

**HOW TO GET MORE FOR YOUR HANDLING DOLLAR** P. 149

You'll find few more promising areas for cost-cutting than materials handling. Conservatively, it's estimated to account for 30¢ of every manufacturing dollar. A systematic approach can sometimes result in surprising increases in output. Here's help from the experts on making the right approach, how to analyze plant problems, on what to consider in choosing material handling equipment.

**TIPS ON SELECTING INDUSTRIAL TRUCKS** P. 157

Your analysis of the problem suggests trucks as the answer. But—whose trucks, and in what type, capacity, size, weight, etc? Here are tips on electric vs. gas trucks, on attachments, on buying vs. leasing, on choosing batteries. Here are points you'll want to consider on truck scheduling systems, maintenance plans.

**CHOOSING THE RIGHT CONVEYORS** P. 160

Conveyors will do jobs for you that manpower alone won't do, or which must often be done under extremely difficult conditions. What are the points to watch for in choosing among floor, overhead, underfloor-type conveyors? What are some of the subsidiary uses of conveyors to keep in mind over and above moving goods?

**PALLETIZING AND PACKAGING CONSIDERATIONS** P. 162

Palletizing and packaging take a sizeable chunk of your handling dollar. This is such a fertile area for shaving costs that it'll pay you to recommend calling in the best experts to help. What are the size, weight and shape of parts you handle? What kind of pallets are best for your needs? Will you want to make or buy wood pallets, and what can be done to extend pallet life? You'll find helpful ideas in this section.

**USING LOADING AND UNLOADING DEVICES** P. 164

Automatic loading and unloading devices have invaded every segment of the metalworking industry. Here's what these mechanical devices can do, and some thoughts on how you can adapt them to your requirements for cutting your handling costs.

## MARKETS AND PRICES

**TV INDUSTRY CATCHING BREATH FOR COLOR ERA** P. 103

Slump in sales natural thing for a young industry. But potential sales believed high because of bigger, better sets, popularity of portable models and most of all, the perfection of color reception.

**HANDLING EQUIPMENT SALES ARE BOOMING** P. 108

It's the only way to describe the healthy condition of the market for the products that help you move materials and parts from here to there. Looks like record sales of $1.5 billion, with emphasis on more specialized units.

**NEW MATERIAL CONTROLS SEEN POSSIBLE** P. 121

Nickel-hungry fabricators who are urging controls, might just be non-defense users any allocation program would hamper. Root of the problem is seen as the need to increase supply without resort to rationing.

**WEST COAST FACTOR IN AUTO RACE MARKET** P. 125

Next week's race at Indianapolis will again see California-made engines and cars leading in number among entries. That's one important reason why West Coast firms have built big business in custom parts racing introduced.

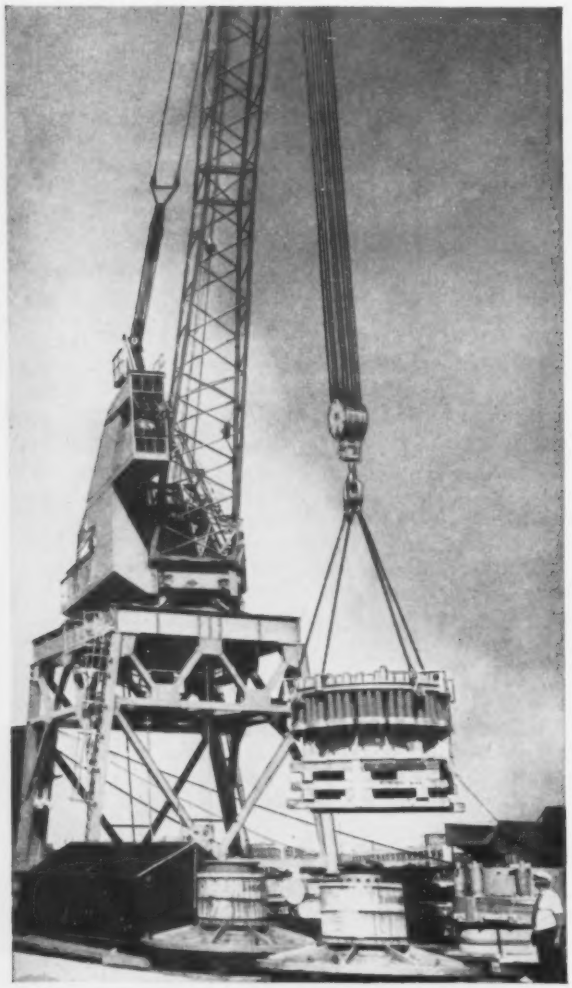
**DON'T SELL THE STEEL MARKET SHORT** P. 215

It's easy to think that steel is coming into a period of greater availability in the months ahead. But don't sell the market short. A fourth quarter rebound is likely to tighten things up again, even without a strike.

## NEXT WEEK:

**HOW TO GET MORE MILEAGE FROM MANAGEMENT**

Walter Semlow, management consultant, discusses ways and means of easing the strain on overworked management. This timely special study by a recognized authority makes interesting reading for metalworkers.



Whatever your needs, Macwhyte makes the sling, wire rope, or assembly for your equipment. Here, two ATLAS Assembly E-2, Round-Braided Slings handle cargo. These balanced braided slings have an excellent reputation for safe, fast, easy handling.

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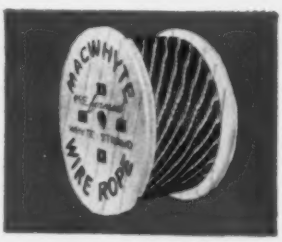


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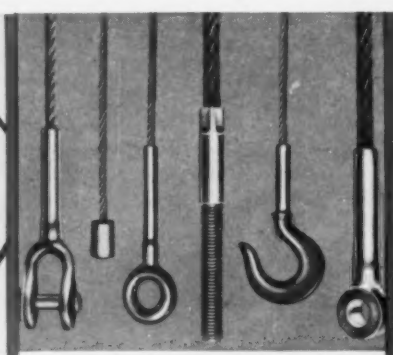
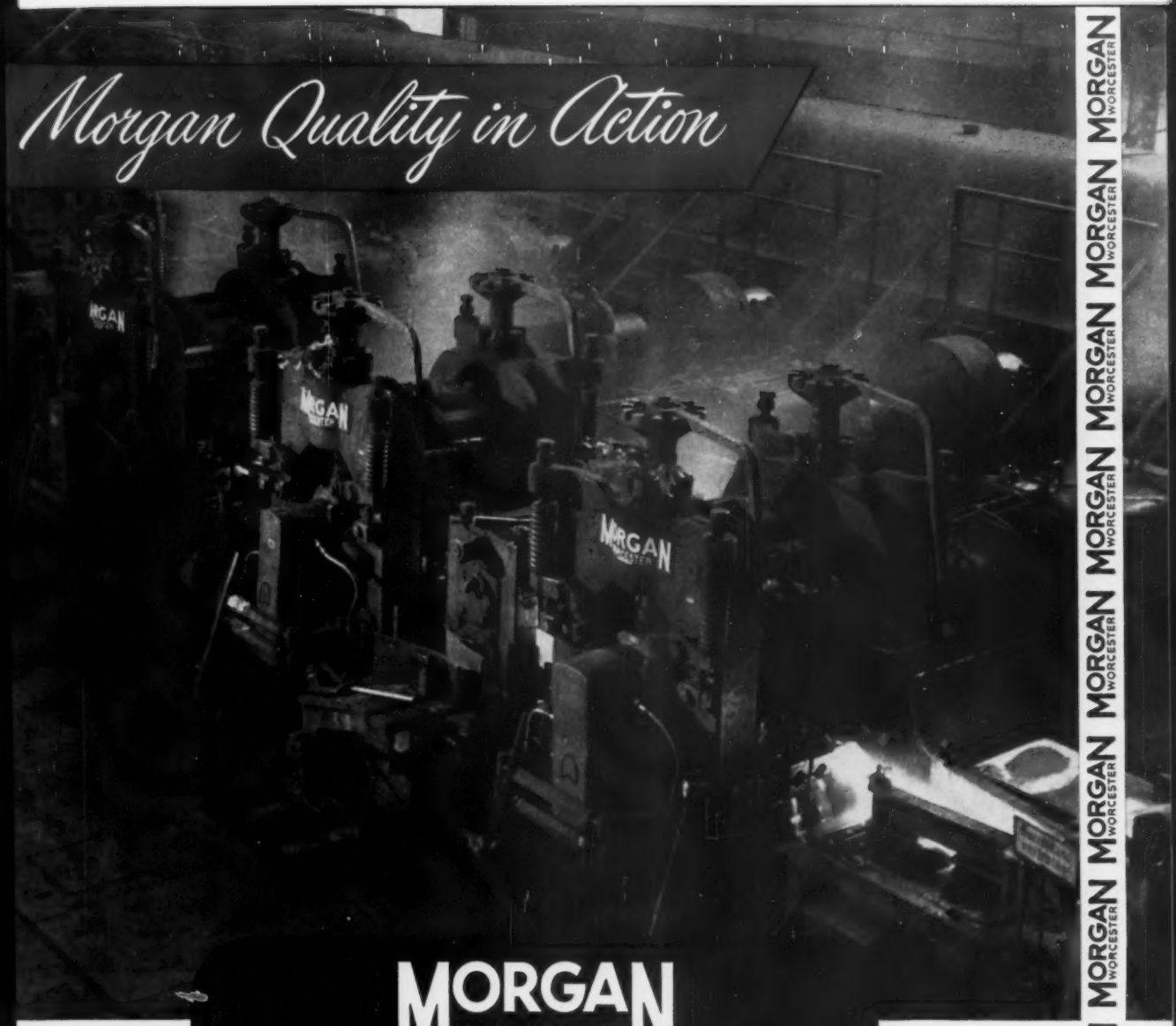


**WIRE ROPE ASSEMBLIES.** Macwhyte Safe-Lock Wire Rope Assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. A wide selection of fittings are made in strengths from 500 to 85,000 lbs. and up. *Request Catalog 5601.*

**WIRE ROPE.** There are *a thousand and one* sizes and types of Internally Lubricated Macwhyte wire rope to give you the *right* rope for any equipment need. *Catalog G-16 lists all wire rope classifications and sizes, as well as general information on use and handling.*

# *Morgan Quality in Action*



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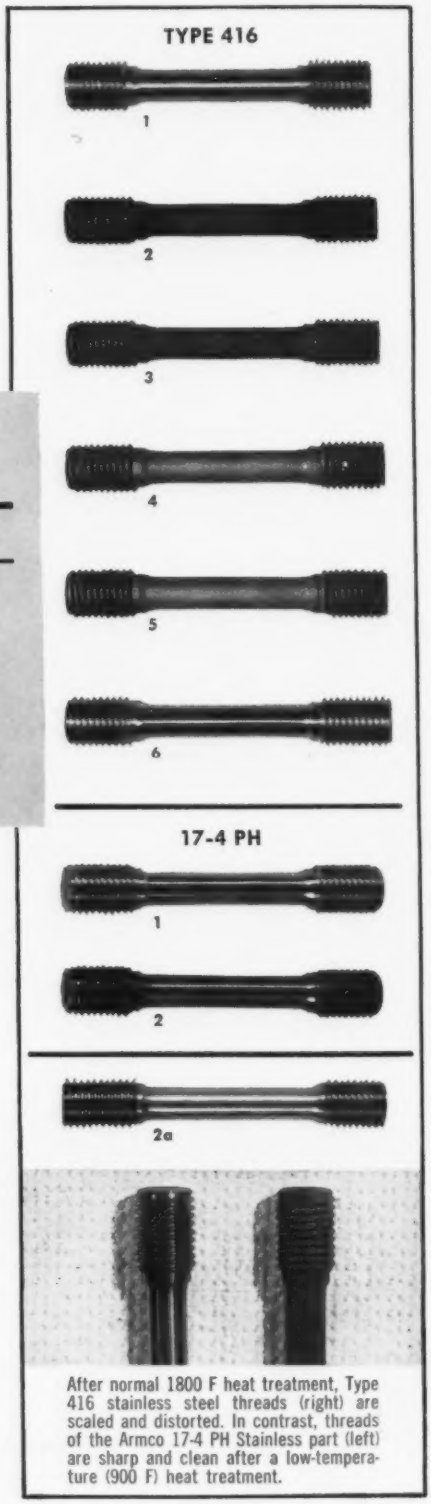
# *How Armco 17-4 PH Stainless*

## may help you eliminate

## 4 costly shop operations

Steps in Production of Specimen Parts With Same Tensile Properties

| Type 416 Stainless Steel | Armco 17-4 PH Stainless Steel |
|---|---|
| 1. Rough machining | 1. Finish machining |
| 2. High temperature heat treatment—about 1800 F | 2. Low temperature heat treatment—850 to 900 F |
| 3. Stress relieving | 2A. Light pickle (needed only when appearance is vital) |
| 4. Pickle | |
| 5. Straightening | |
| 6. Finish machining | |






After normal 1800 F heat treatment, Type 416 stainless steel threads (right) are scaled and distorted. In contrast, threads of the Armco 17-4 PH Stainless part (left) are sharp and clean after a low-temperature (900 F) heat treatment.

If you machine stainless parts that must have high strength and hardness, here's a special Armco Stainless Steel that can cut as many as four operations from your shop practice.

It's Armco 17-4 PH, a special stainless steel that can be finish-machined and then hardened fully with a *low-temperature* heat treatment. *There's no scaling or distortion.* Parts can be completely finished in just two operations.

In the production of these stainless parts, for example, a switch from Type 416 stainless to Armco 17-4 PH eliminated 4 steps—stress relieving, pickling, straightening, and a final machining operation.

But that's not the whole story. Not only does the finished 17-4 PH part have the same tensile properties as the Type 416 stainless part . . . *it has better corrosion resistance.*

### TWO PH GRADES

Armco 17-4 PH is available in billets, bars and wire. Its companion precipitation hardening grade, 17-7 PH, is produced in sheets, strip, plates, bars and wire. For full information about these special Armco Stainless Steels, just write us at the address below.

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# EDITORIAL

## Are We Going Soft?

◆ MEN ARE TALKING about more than business these days. The temper of the times has increased the tensions in our daily life. No one will deny this. The income tax has almost wiped out incentive in many cases. And it might not be far wrong to say that unconsciously the H-bomb is playing its part in our lethargy of spirit.

Mr. Eisenhower's heart attack has caused many men to think about letting up a little; cutting down on the rush and the pressures. More people are criticising jobs and tensions; saying they are responsible for much of our unhappiness or instability.

Listen to any group of men as they gather for conversation. Soon the talk veers to health, spiritual topics or philosophical outlooks. You hear such questions as: Is it worth it? Am I knocking myself out? What do you get in the end? Why should I work half of my time for the government?

More serious is the trend among our youngsters. Before they are off the campus they want to know: What time do I start? Quit? How long before I get pensioned? What about vacations? When does the first raise come? When will I be boss? They must have gotten these ideas from us; they can't be inherited to that extent.

Are we going soft? Are we going overboard worrying about our jobs and the tensions? Do we want the most with the least effort? Many old-timers think so; and many not-so-old-timers think so too. Are too many of us blaming our work instead of looking to ourselves? Is the increased sale of up-lift books a measure of our illness?

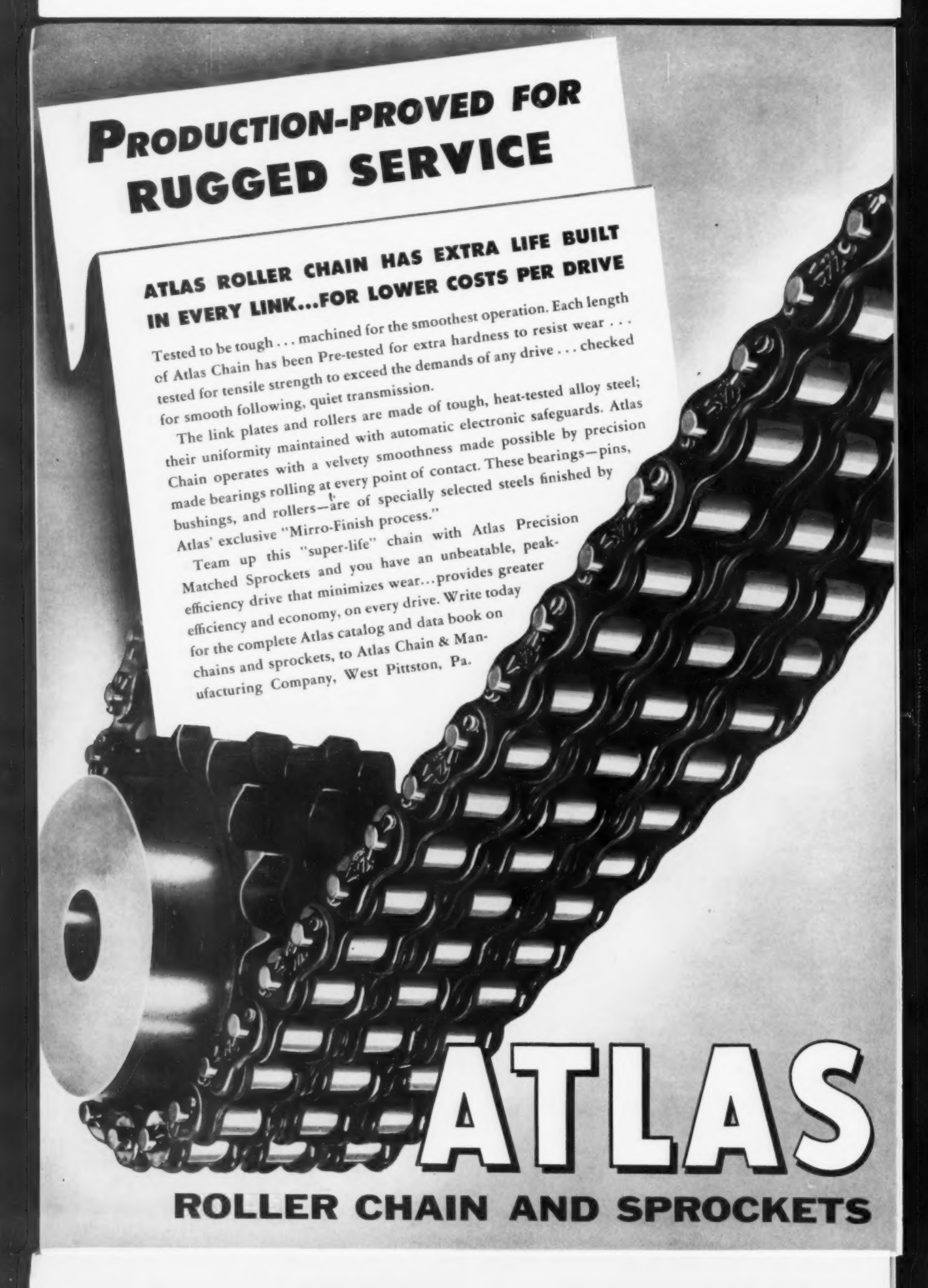
Jobs and tensions can be controlled without submitting to ulcers, heart attacks, divorces or estranged children—unless these things are due to something far removed from our work. Of course it doesn't do us any good to knock ourselves out on the job. But someone has to do the top jobs, the hard jobs and the thinking jobs. The shortage of those who are willing—and able—to tackle these challenges is becoming serious for us, for our country and for our economy.

It takes a lot of growing up—and moderation—to lick tension, hard work and responsibilities. One man's knockout drops may be another's benzedrine. We must pick the right medicine. It looks as if we need emotional stability more than anything else.

Tom Campbell

EDITOR-IN-CHIEF

# PRODUCTION-PROVED FOR RUGGED SERVICE



## ATLAS ROLLER CHAIN HAS EXTRA LIFE BUILT IN EVERY LINK...FOR LOWER COSTS PER DRIVE

Tested to be tough . . . machined for the smoothest operation. Each length of Atlas Chain has been Pre-tested for extra hardness to resist wear . . . tested for tensile strength to exceed the demands of any drive . . . checked for smooth following, quiet transmission.

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Team up this "super-life" chain with Atlas Precision Matched Sprockets and you have an unbeatable, peak-efficiency drive that minimizes wear...provides greater efficiency and economy, on every drive. Write today for the complete Atlas catalog and data book on chains and sprockets, to Atlas Chain & Manufacturing Company, West Pittston, Pa.

# ATLAS

## ROLLER CHAIN AND SPROCKETS

## dear editor:

*letters from readers*

### Screw Machine Products

Sir:

Kindly send us 100 reprints of your article "Screw Products: How To Buy Better" in the May 10th issue.

We feel the article is timely and to the point. Its appearance in your publication we feel, will give it a great deal of prestige and influence among screw machine products buyers. *George Kelly, Duro Screw & Mfg. Co., Union, N. J.*

### Profit Sharing

Sir:

We have read with interest your April 12th article on profit sharing.

Could you give us any information about Mr. Joseph Meier, of the Council of Profit Sharing Industries? Could we obtain sample plans from this organization, do you have their address, and what sort of charge is made by them if any? *C. F. Fletcher, Vice-President, Quick Charge, Inc., Oklahoma City.*

For further information we suggest you write Mr. Joseph Meier, Executive Secretary, Council of Profit Sharing Industries at 337 W. Madison St., Chicago 6, Ill.—Ed.

### Welding Dollar

Sir:

Please send me as soon as possible 6 copies of your article entitled "How to Get More For Your Welding Dollar." This particular article is number 3 of a series including "Welding Rod and Electrode Charts" in your April 26 issue. *F. P. Shephard, District Sales Mgr., Haynes Stellite Co., Cleveland, Ohio.*

### Plant Gambling

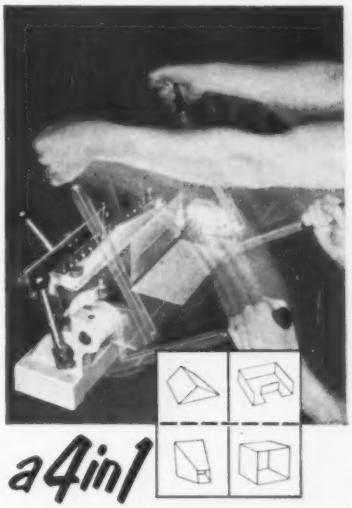
Sir:

I have read with interest your special report on "Plant Gambling," in the March 22 issue. It recalled to mind some experiences I have had in the past. The first was when I happened to be working where there was a crew erecting a big steel structure. A storm hit the job and the steel erectors sought temporary shelter. Before the storm was over, some of the men owed

their whole week's pay.

Another experience was in a Government plant which was apparently beyond the reach of the local law enforcement people. There were periodic raids made by the local police and arrests were made because the persons involved were agents for the gamblers who managed the numbers game. The people most often convicted and fined were the barbers.

At the same time, the agents of these pools were given free access to the Government plant and were reaping a harvest from the Government employees. I never discovered whether anyone was paid for this open door policy, but on the grounds of common decency and fairness, I took steps to close the door. The interesting thing is that such gamblers usually have no love for anyone who protects them from the scourge. *C. E. Patch, Morton C. Tuttle Co., Boston, Mass.*

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**Accurately, Easily, Quickly Form and Duplicate a Wide Variety of Shapes in Metal as Heavy as 16 Gauge—Widths up to 24" —with Versatile Di-Acro Brakes.**

A number of forming jobs can be done with the Di-Acro Box Finger Brake, by simply adjusting or changing the type of mounting bar on the contact surface. Di-Acro Finger Brake is:

- **Box and Pan Brake** — when equipped with a complete set of Box Fingers.
- **Open End Brake**— when Open End Finger is installed in place of Box Fingers.
- **Bar Folder** — when an Acute Angle Bar replaces the Box Finger Bar mounting.
- **Standard Brake** — when a Forming Bar is mounted for heavy operations.

Di-Acro Standard and Radius Brakes are also available. Ten models in all.

*pronounced Die-ack-ro

**WANT MORE INFORMATION?**

A helpful book on selecting Brakes is yours for the asking. Consult the yellow pages of your phone book for the name of your nearest Di-Acro distributor or write us.

*Creators of "Die-Less Duplicating"*

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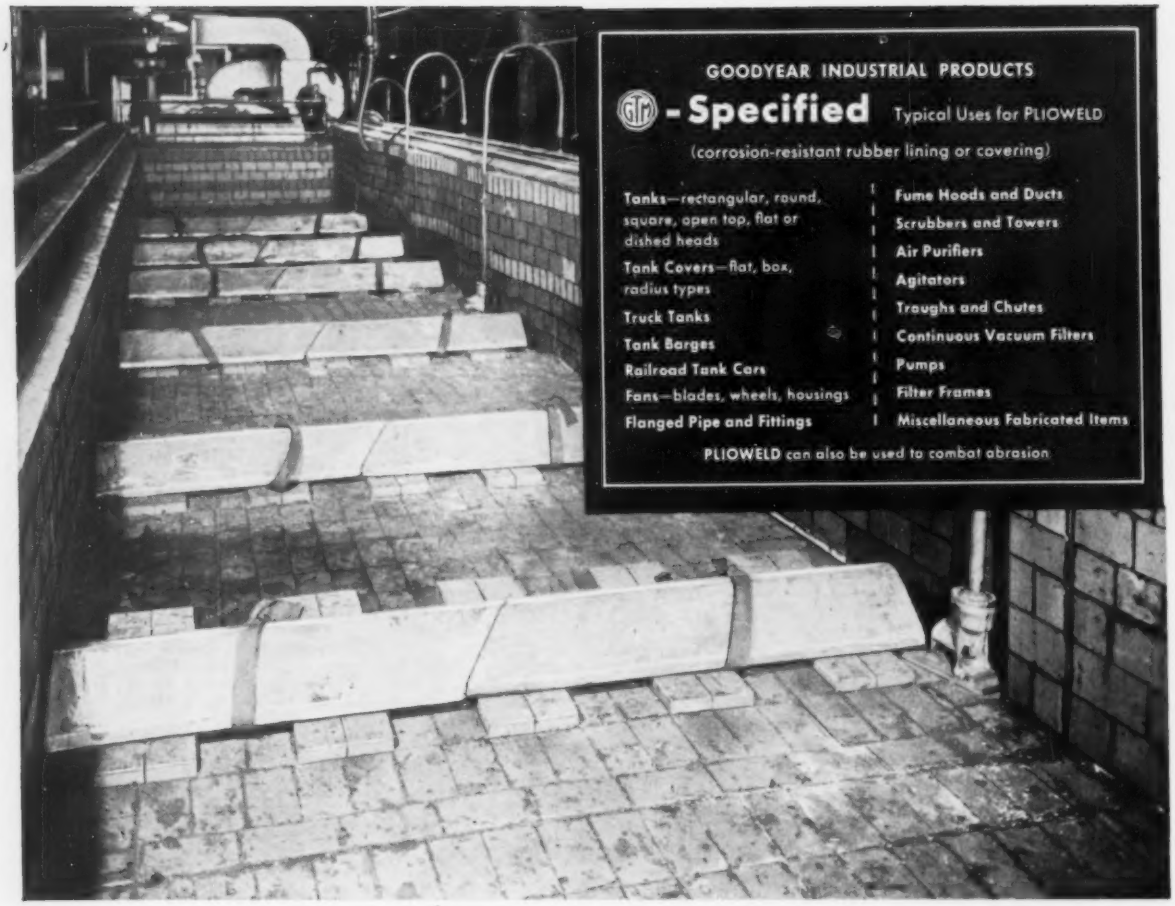
Lake City, Minn.

di-acro PRECISION METALWORKING MACHINES




# G.T.M. reduces pickling tank maintenance by 66%

ALMOST weekly repair of a lead-lined, wooden pickling tank was a major problem for this Midwestern steel processor. Maintenance cost alone ran into the thousands of dollars every year. Moreover, the lead often stuck to the steel strip, causing additional problems.

Finally it was decided to install a steel tank. The G.T.M.—Goodyear Technical Man—recommended a PLIOWELD rubber lining plus two courses of acid-resistant brick. He also helped to develop a series of unique thermal expansion joints between the 40-foot tank sections. Result: *No shutdowns in two years,* except for normal cleaning—maintenance slashed to *one-third its former cost.*

Similar savings may be yours on any industrial rubber application by consulting the G.T.M. Contact him through your Goodyear Distributor, or write Goodyear, Industrial Products Division, Akron 16, Ohio.

**PLIOWELD TANK LININGS by**

**GOODYEAR**

**THE GREATEST NAME IN RUBBER**

Plioweld—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

**IT'S SMART TO DO BUSINESS** *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

## fatigue cracks

*by William M. Coffey*

### Do You Like It?

A few weeks ago we pointed out a new column "Metalworking Briefs," facing the next to the last page of your f.f.j. But we're not crazy enough to assume that everyone reads every page every week. Lots do, but not all. So if you missed it, have a look. Any reactions? Any questions?

### B. Franklin, Printer & Electrician

We hate to admit it but so far we haven't been very patriotic Philadelphians in that we've said very little about an esteemed electrician who was born in these parts some 250 years ago.

### Man On Deck

Fortunately we had a man on deck when Leeds & Northrup officially opened its new 275,000 sq ft plant recently in North Wales, a Philadelphia suburb. He took the 2-hour tour, reports that they have $7 million worth of equipment in the $4 million building, all for making instruments. Also, they use their own heat treating equipment which they make in another plant.

But, and here's where we get a chance to pay our respects to Mr. Franklin, there was a gimmick at the opening. As L & N president I. Melville Stein welcomed the guests, an actor impersonating Ben Franklin approached a copper sphere and touched it with a statically charged glass tube (See cut), setting in motion a battery of instruments (that just happened to be made by L & N). This ignited a magnesium tape stretched across the entrance—and the tour was on.

### Puzzlers

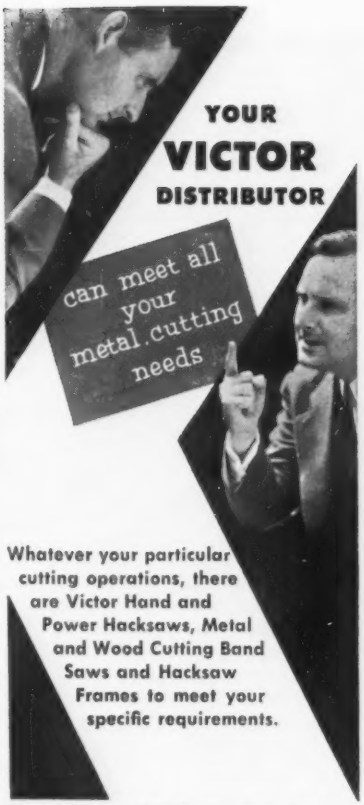
An old hermit, moving from one shack to another, was carrying a bag of corn and a canary in a cage. He was accompanied by a dog and a cat and he was leading a goose by a string tied around its neck.

Midway he came to a stream. It could be crossed only by means of a small canoe capable of holding only him and two of the five things he was bringing. This posed a problem:

If he left the dog and the cat together, they would stage a fight; if he left the corn and the goose together, the goose would eat the corn; if he left the cat and the canary together, the cat would eat the bird. But he got over successfully and reached a second stream. Here also was a canoe but so small that it would hold him and only one of the five things.

How did he arrange to get them all across both streams without mishap?

"BEN FRANKLIN'S" static charge triggers magnesium tape as L & N president I. M. Stein opens new Philadelphia plant.


**Whatever your particular cutting operations, there are Victor Hand and Power Hacksaws, Metal and Wood Cutting Band Saws and Hacksaw Frames to meet your specific requirements.**

Every Victor distributor can give you prompt delivery of any metal cutting saw you want. His men are backed up by Victor factory experts who can show you the way to new speed and economy on production metal sawing operations.

Remember, no blade on the market will cut faster or last longer than the right Victor Blade – at the price you want!

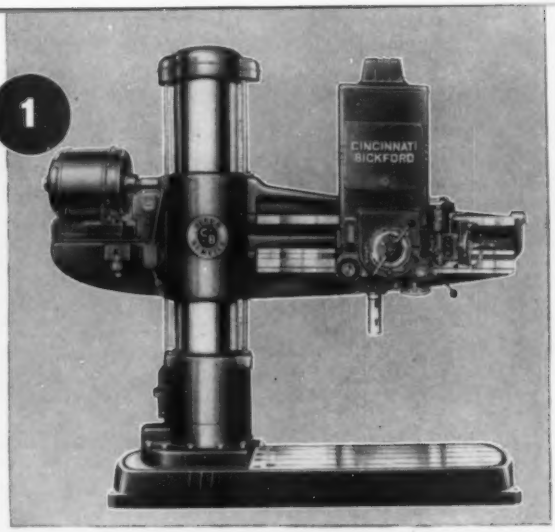
And for top performance at a low price, use Victor "Moly"® High Speed Steel blades. Victor developed this high speed, heavily-alloyed steel blade of molybdenum. Remember, "Moly" High Speed blades outlast standard steel blades 10 to 1, cut as well as the *best* high speed steel blades made, but are substantially lower in cost.

***Free!***
**Ask your Industrial Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts.**

*Sold Only Through Recognized Distributors*

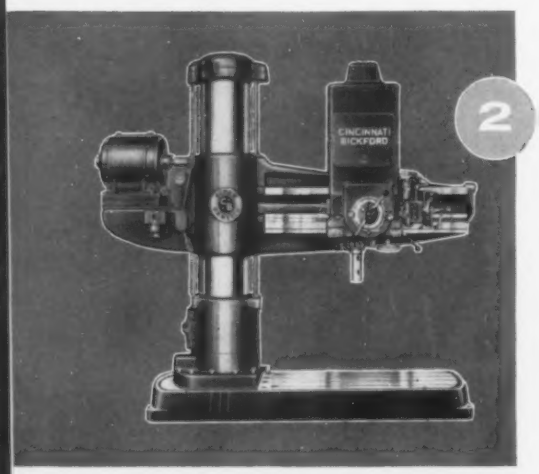
VICTOR ® 1956

**SAW WORKS, INC., MIDDLETOWN, N.Y., U.S.A.**
MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES



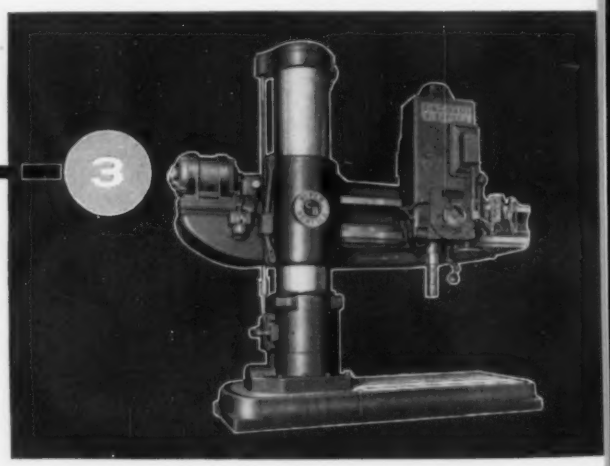

1

*New 100% hydraulic pre-selection of all 36 speeds and 18 feeds gives this line of Super-Service Radials maximum performance and ease of handling. A simple prescheduling device shows speeds and feeds to be used on each successive operation and provides a permanent record. Ask for Bulletin R-33.*




2

*Speed range pre-selector, in conjunction with one speed change lever controls selection of 36 speeds. This new line of Super-Service Radials is for heavy duty work where split-second savings are not so important. Bulletin R-32 gives details.*



3

*Super-Service Radials with lever shifts for all speed and feed changes are still preferred by many who know the dependable ruggedness of these machines. Write for Booklet R-29.*

# One of these 3 will do your job BEST---

You have a choice, in Super-Service Radials, as to the extent to which automatic gear shifting and preselection of speeds and feeds will be employed.

The highest development is shown at Fig. 1; but for many kinds of heavy duty work, the machine with speed range pre-selector and lever shifts for other changes, is to be preferred. Look at all three—by writing now for latest catalogs.

**CINCINNATI BICKFORD**

SUPER C·B SERVICE

G&L

RADIAL AND UPRIGHT DRILLING MACHINES

**CINCINNATI BICKFORD DIVISION**

GIDDINGS & LEWIS MACHINE TOOL COMPANY

OAKLEY, CINCINNATI 9, OHIO, U.S.A.

## dates to remember

### MAY

WIRE REINFORCEMENT INSTITUTE —Annual spring meeting, May 28-30, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, National Press Bldg., Washington 4, D. C.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, May 28-June 2, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 39 S. Dearborn St., Chicago.

STEEL JOIST INSTITUTE — Annual meeting, May 29-30, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, Dupont Circle Bldg., 1346 Connecticut Ave., Washington, D. C.

EXPOSITIONS

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

THE SOCIETY OF THE PLASTICS INDUSTRY, INC., June 11-15, New York City.

ASSN. OF IRON & STEEL ENGINEERS, Sept. 25-28, Cleveland.

METAL SHOW—Oct. 8-12, Cleveland.

### JUNE

AMERICAN GEAR MANUFACTURERS ASSN.—40th annual meeting, June 3-6, The Homestead, Hot Springs, Va. Society headquarters, one Thomas Circle Washington 5 D. C.

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Summer meeting, June 3-8, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters, 29 W. 39th St., N. Y.

AMERICAN SOCIETY OF CIVIL ENGINEERS—National spring convention, June 4-8, Knoxville, Tenn. Society headquarters, 33 W. 39th St., N. Y.

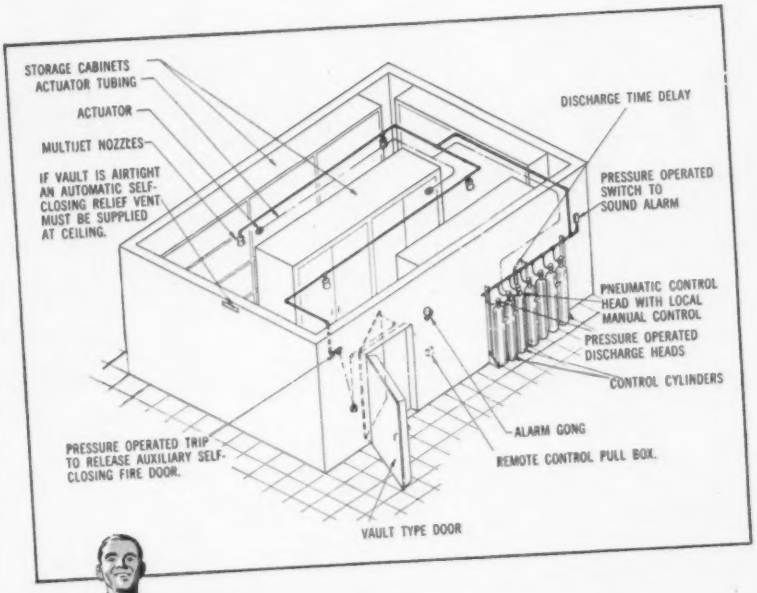
SOCIETY FOR ADVANCEMENT OF MANAGEMENT—Small business conference, June 7-8, Hotel Statler, N. Y. Society headquarters, 74 Fifth Ave., N. Y.

THE NATIONAL ASSN. OF METAL FINISHERS — Annual meeting and fifth management seminar, June 17-18, Mayflower Hotel, Washington, D. C. Society headquarters, 35 E. Wacker Dr., Chicago.

AMERICAN ELECTROPLATERS' SOCIETY—43rd annual convention, June 18-21, Hotel Statler, Washington, D. C. Society headquarters, 445 Broad St., Newark, N. J.

ALLOY CASTING INSTITUTE—Annual meeting, June 24-26, The Homestead, Hot Springs, Va. Society headquarters, 32 Third Ave., Mineola, N. Y.

DROP FORGING ASSN.—Annual meeting, June 24-27, The Homestead, Hot Springs, Va. Society headquarters, 605 Hanna Bldg., Cleveland, O.



STORAGE CABINETS
ACTUATOR TUBING
ACTUATOR
MULTIJET NOZZLES
IF VAULT IS AIRTIGHT AN AUTOMATIC SELF-CLOSING RELIEF VENT MUST BE SUPPLIED AT CEILING.
DISCHARGE TIME DELAY
PRESSURE OPERATED SWITCH TO SOUND ALARM
PNEUMATIC CONTROL HEAD WITH LOCAL MANUAL CONTROL
PRESSURE OPERATED DISCHARGE HEADS
CONTROL CYLINDERS
ALARM GONG
REMOTE CONTROL PULL BOX.
PRESSURE OPERATED TRIP TO RELEASE AUXILIARY SELF-CLOSING FIRE DOOR.
VAULT TYPE DOOR

# GUARD VALUABLE RECORDS WITH THIS ENGINEERED FIRE PROTECTION!

Just let fire destroy one irreplaceable set of records — or original drawings—and your business stands a good chance of bankruptcy! And keep in mind that 44% of the firms whose doors are closed by fire *never* reopen for business again!

It's easy to see, therefore, why farsighted business executives insist on Kidde fire protection to safeguard their business records. Kidde systems — like the record vault installation shown above — are tailor-made to *fully* protect the many different kinds of hazards you'll find in industry today.

With a Kidde system on the job, fire is out almost as soon as it starts. Kidde rate-of-temperature-rise detectors trigger the system at the first sign of a blaze, guarantee you round-the-clock protection even in case of outside power failure. Using safe, efficient carbon dioxide gas, Kidde systems snuff fire *without* a mess, will *not* damage records, papers or drawings!

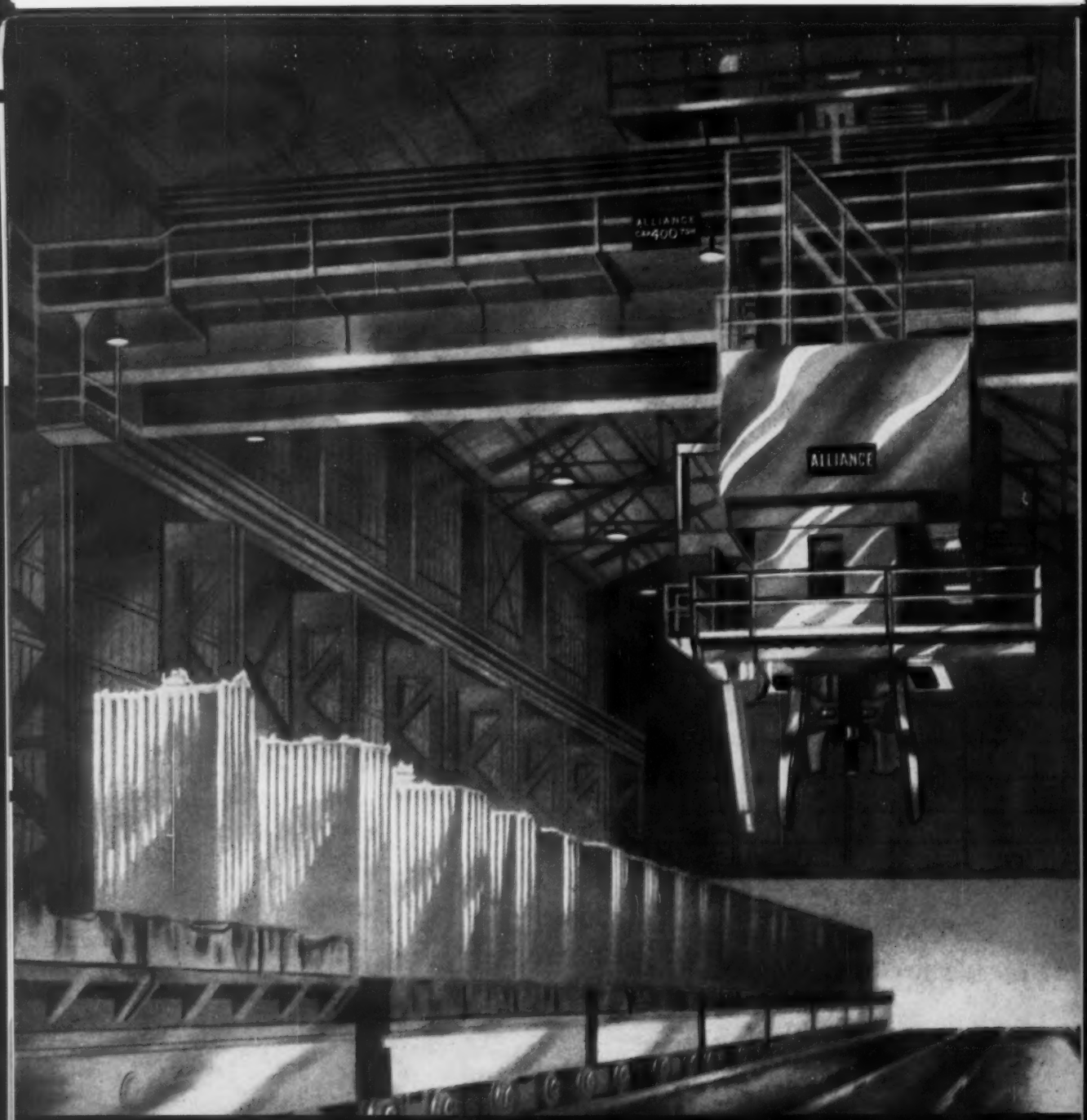
Kidde systems have no falling weights, use no clumsy mechanical triggering methods. Pneumatic Control Heads insure instant and complete $CO_2$ discharge. All moving parts of a Kidde system are self-enclosed for safety, need no replacement after a fire, have easy-to-read indicators which show whether system is "set" or "released."

It's easy to get the best in fire protection — and it *can* mean the difference between profit and loss for you. For more information, write Kidde today.

**Kidde**

**Walter Kidde & Company, Inc.**
**549 Main St., Belleville 9, N. J.**
Walter Kidde & Company of Canada, Ltd.
Montreal—Toronto

*The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.*




# THE WORLD'S LARGEST STRIPPER CRANE

• This 400-ton Alliance push-pull Stripper Crane is the world's largest. It can exert 2,400,000 pounds' pressure to strip moulds from ingots — cleanly and safely. The patented Impact Stool Loosener speeds up the stripping operation. The stripping mechanization has a nominal rating of 400 tons but is designed to stand forces of 1200 tons. Its many exclusive design features are a result of Alliance's knowledge of mill problems and requirements. They design the world's biggest cranes, manipulators and special machinery. Their experience assures you the best in modern design. A letter, wire or phone call will put your problems into the hands of The World's Largest Builders of the World's Largest Cranes.

## THE ALLIANCE MACHINE COMPANY

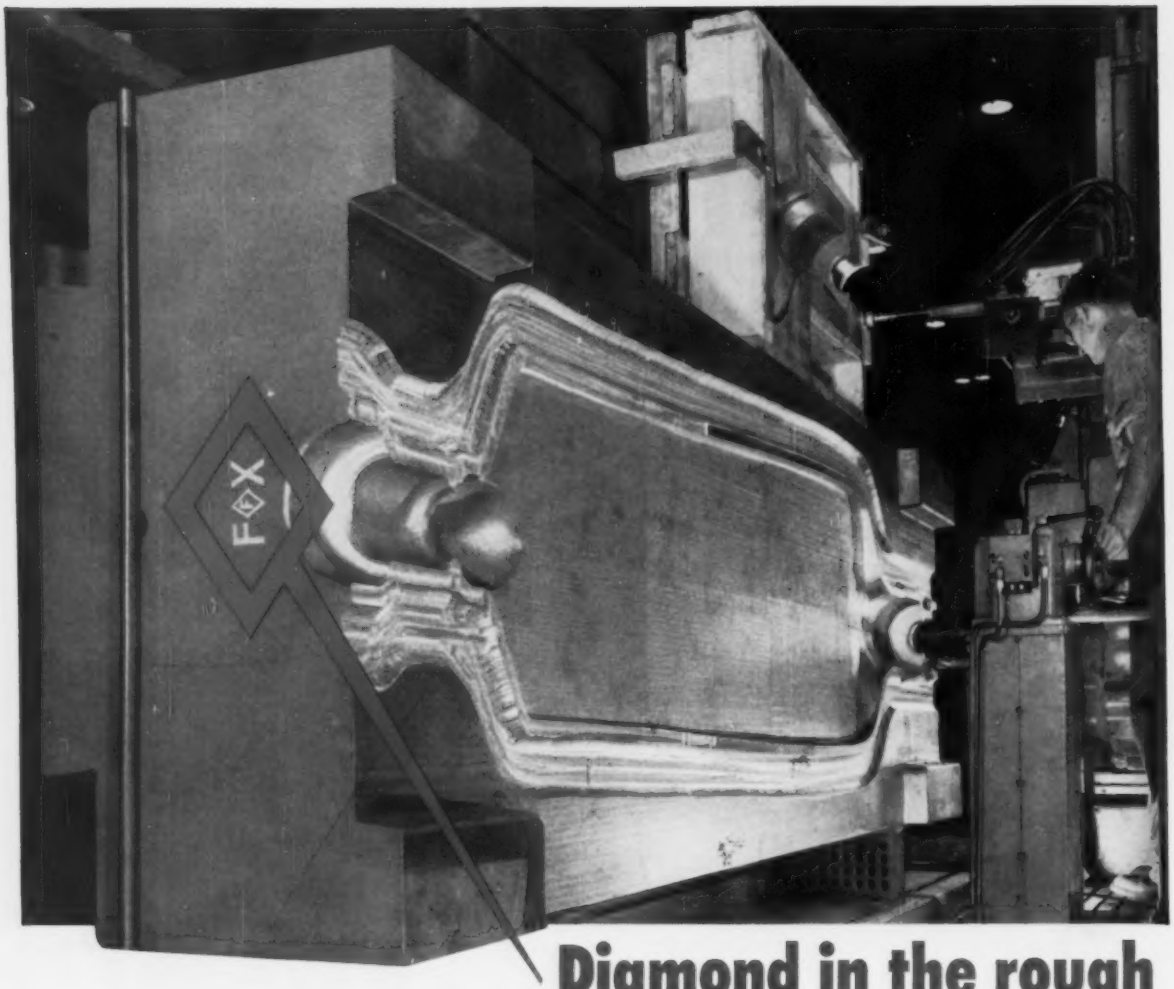
**EXCLUSIVE with ALLIANCE**

*The Alliance Impact Stool Loosener makes your stripper crane more useful, more efficient and saves wear and tear on the crane and ingot buggies. The Impact Stool Loosener can be installed on most stripper cranes now in your service.*

# Alliance

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION • COKE PUSHERS

• MAIN OFFICE • ALLIANCE, OHIO




# Diamond in the rough

This 42,000 pound Finkl FX die nearing completion at the Ladish Co., Cudahy, Wisconsin, will be utilized by that firm in drop forging 1681 pound close tolerance aircraft propeller blades. FX is but one of many Finkl steels available for forging operations, all of which are quality controlled with "built-in" characteristics required for precision production. For the proper die steels to fit your needs, ask your local Finkl representative or write for the Finkl catalog.

When you next consider hot work tooling, die blocks, or forgings, call on Finkl for "impressions that last."

DIE BLOCKS
•
HOT WORK STEEL
•
FORGINGS
•
ELECTRIC FURNACE STEELS

Offices in: DETROIT • CLEVELAND • PITTSBURGH • INDIANAPOLIS
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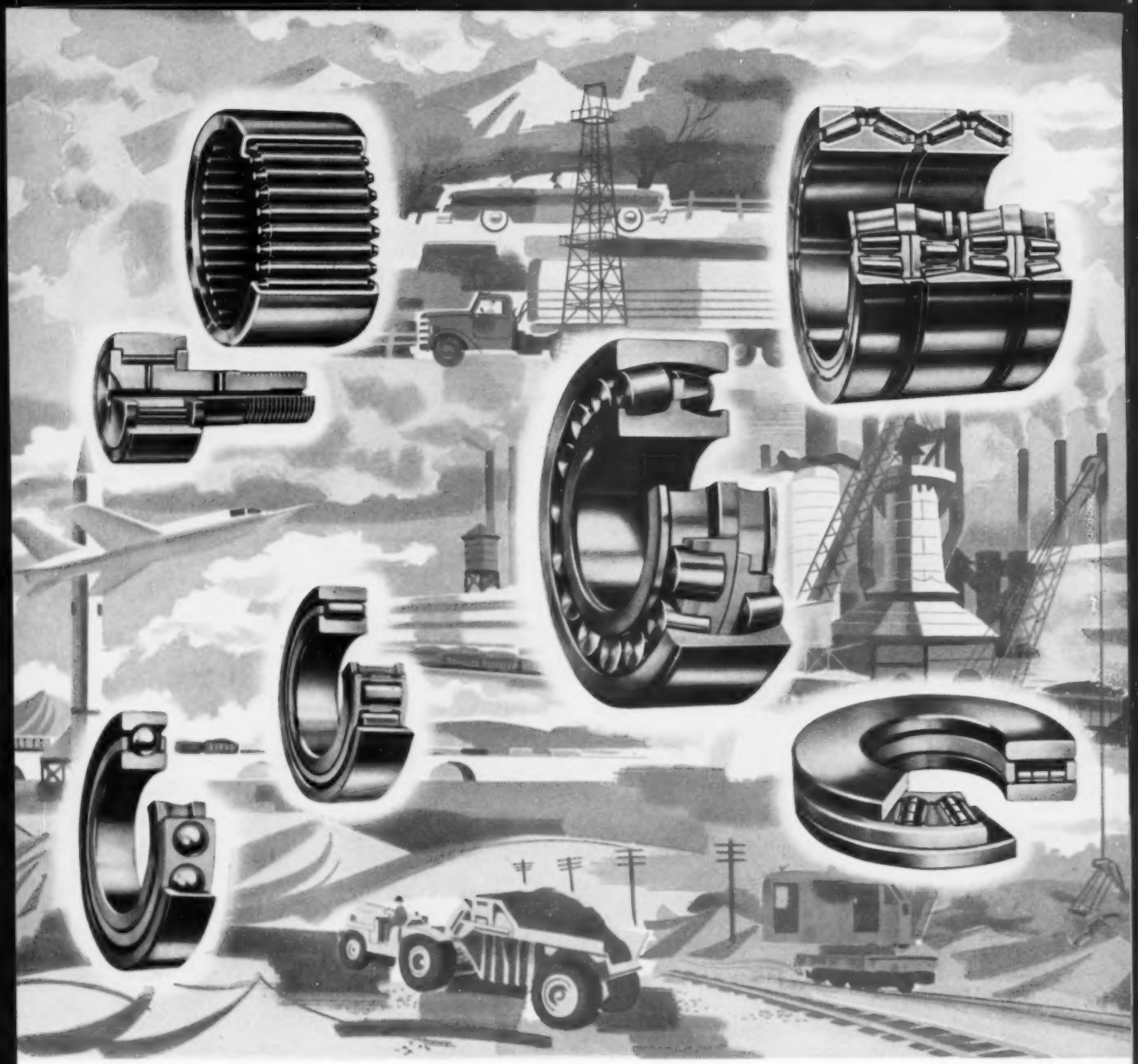
## A. Finkl & Sons Co.

2011 SOUTHPORT AVENUE • CHICAGO 14



# WHEN YOU NEED A BEARING—*remember this:*

## **TORRINGTON** *makes every basic type of anti-friction bearing*

**When there isn't a bearing big enough or small enough to do the job you want...**

TORRINGTON will build it for you to the size and tolerances you need.

**When you have a special problem...**

A TORRINGTON ENGINEER will consult with you and recommend a bearing that's best for the job. You can rely on his judgment because bearings are his business and he has the backing of engineering staffs at Torrington, Conn., and South Bend, Ind.

We're proud we can offer our customers a service of such breadth and depth.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
*District offices and distributors in principal cities of United States and Canada*

## TORRINGTON BEARINGS

90th ANNIVERSARY 1866–1956

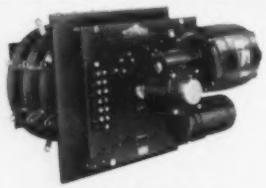
Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

*In electroplating, anodizing, and allied processes...*

# Rectifier Performance Depends on Controls

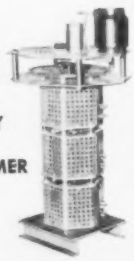
**MANUAL TAP SWITCH CONTROL**

For both self-contained and remote controlled units. Used in conjunction with a tapped auto-transformer, it provides 22 positions of voltage adjustment from zero to rated voltage.



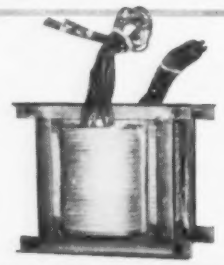
**MOTOR-OPERATED TAP SWITCH CONTROL**

For pushbutton control of output from remote location. Used in conjunction with tapped auto-transformer and it also gives 22 positions of voltage adjustment.



**CONTINUOUSLY VARIABLE AUTO-TRANSFORMER**

Either manual for small rectifiers, or oil-immersed, motor-driven for larger ratings. Gives full stepless control from zero to rated voltage. Highest efficiency.



**SATURABLE CORE REACTOR**

Wholly electrical — no moving parts. Gives smooth control from 10% to 100% of rated voltage, provided 10% minimum current load is drawn.

The selection of the proper controls with either selenium or germanium rectifiers can be the key to improving your plating and anodizing results. For every installation there is a control which will best fit the application. Let H-VW-M make an engineering survey and recommend the most suitable control to give you not only the best results, but also the maximum in efficiency, flexibility, and economy.

## APPLICATION SUGGESTIONS

| Use | Recommended Control |
|---|---|
| Batch Tank Plating | Manual tap switch. |
| Batch Tank Plating with wide load variations and high production | Motor operated variable auto-transformer or motor operated tap switch. |
| Barrel Plating | Manual tap switch. No control rectifier. |
| Cleaning & Pickling | Manual tap switch. No control rectifier. |
| Conveyor—many stations | Manual tap switch (remote control). Motor operated tap switch. Saturable core reactor. Motor operated continuously variable auto-transformer. |
| Conveyor—few stations | Automatic voltage stabilization with variable auto-transformer. Automatic voltage stabilization with saturable core reactor. |
| Chrome strike in combination with Plate | Automatic programming with variable auto-transformer or special series hook-up. |
| Sulphuric Anodizing | Manual tap switch. Motor operated tap switch. Saturable core reactor. |
| Color Anodizing | Automatic constant current with variable auto-transformer. Automatic constant current with magnetic amplifier and saturable core reactor. |
| Chromic Anodizing | Automatic programming with variable auto-transformer. Combination automatic constant current and automatic voltage stablization with variable auto-transformer or saturable core reactor. |
| Electrolytic Metal Refining | Automatic current control with saturable core reactor. |

3110.

### *Need Automatic Voltage Stabilization?*

For close DC voltage regulation, automatic voltage stabilization will maintain voltage at pre-set level. Use either sensing panel with motor-driven, oil-immersed continuously variable auto-transformer, or special magnetic-amplifier with saturable core reactor. H-VW-M controls can also provide automatic constant current.

### *Need Automatic Programming?*

Motor-operated continuously-variable auto-transformers, plus timers and controls, will set voltage and operate for pre-set time; change to another voltage at pre-set rate; operate at new voltage for given time, then shut the rectifier off.

PLATEMANSHIP

Your H-VW-M combination — of the most modern testing and development laboratory — of over 80 years experience in every phase of plating and polishing — of a complete equipment, process and supply line for every need.

*SEND TODAY for free Bulletin ER-108 describing H-VW-M SELENIUM and GERMANIUM Rectifiers and H-VW-M's full line of controls.*

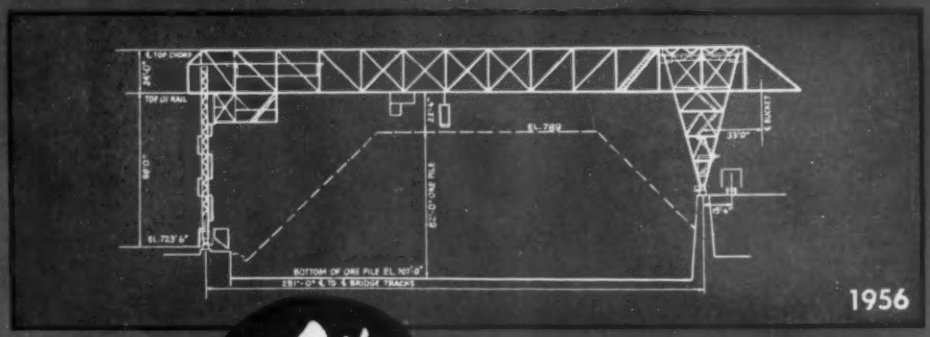
**HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, N. J.**
*Plants:* Matawan, N. J. • Grand Rapids, Mich.
*SALES OFFICES:* Anderson (Ind.) • Baltimore • Beloit (Wisc.) • Boston Bridgeport • Chicago • Cleveland • Dayton • Detroit • Grand Rapids • Los Angeles • Louisville • Matawan • Milwaukee New York • Philadelphia • Pittsburgh • Plainfield • Rochester St. Louis • San Francisco • Springfield (Mass.) • Utica Wallingford (Conn.)

**H-VW-M**

**INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES**

# UP GOES PRODUCTION AT WEIRTON STEEL COMPANY . . .

Division of National Steel Corporation




## and UP goes the 4th Heyl & Patterson Ore Bridge

3rd 1952

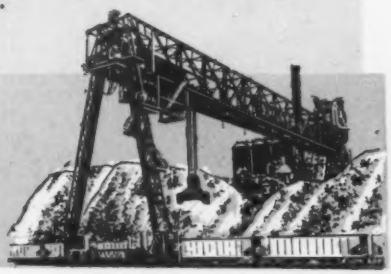
2nd 1942

1st 1926

Any equipment that contributes to increased production by National Steel's Weirton Steel Company division must be time-tested for dependable performance.

In 1926 (30 years ago) Heyl & Patterson built Ore Bridge No. 1 . . . in 1942 Ore Bridge No. 2 . . . in 1952 Ore Bridge No. 3. All three Ore Bridges are in successful operation. Now . . . Ore Bridge No. 4 is being built by Heyl & Patterson to accelerate the ever-mounting steel production records of Weirton Steel Company.

Wherever Ore and Coal Bridges are essential to consistent, time-tested production you can depend upon Heyl & Patterson Engineering, Fabricating, and Erection. Having an H & P Authority on Ore Bridges consult with you involves no obligation.



**Heyl & Patterson**
**INC.**

55 FORT PITT BLVD. PITTSBURGH 22, PA. PHONE COurt 1-0750

TISHOLT

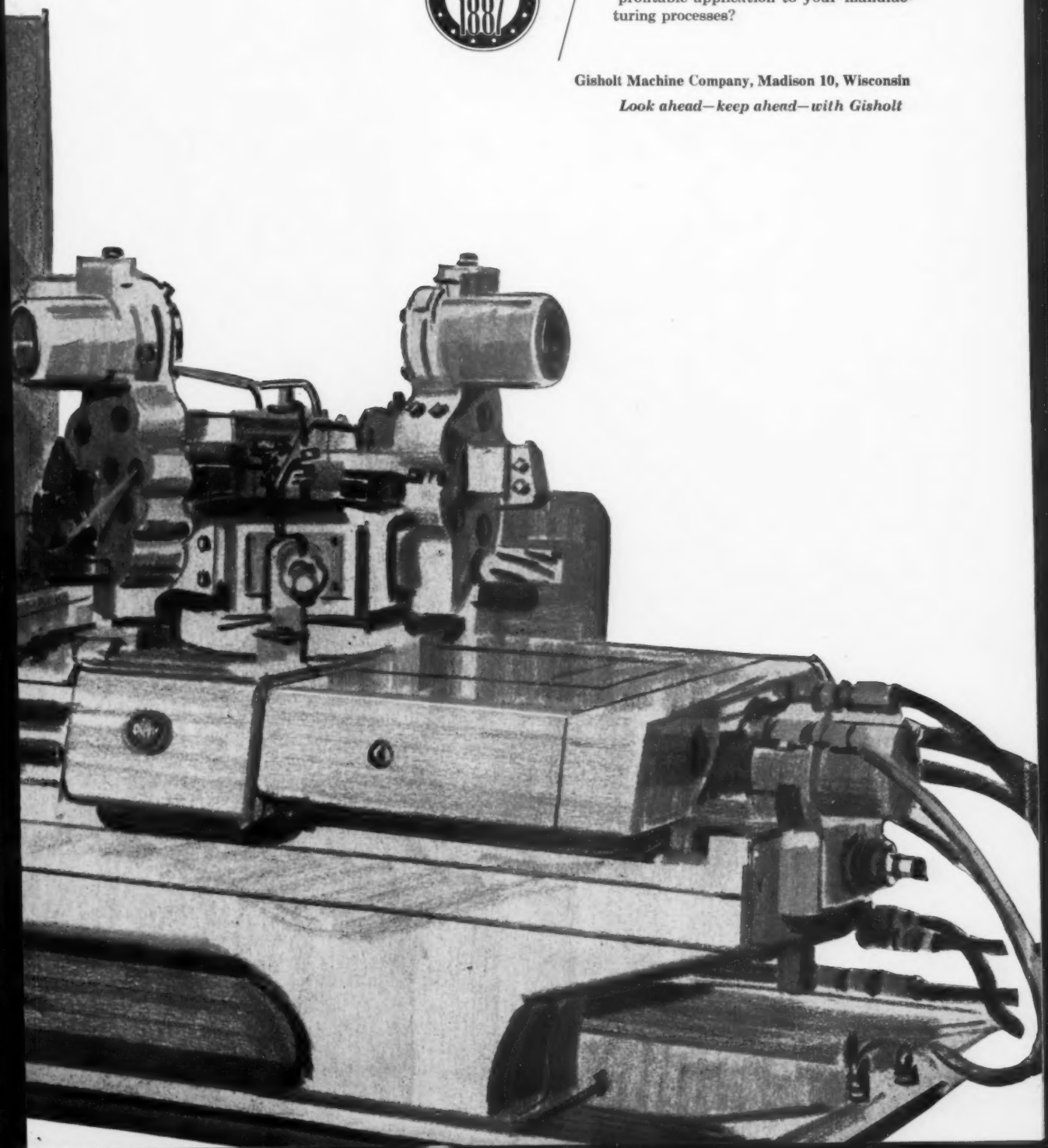
# GISHOLT MASTERLINE FASTERMATIC AUTOMATIC TURRET LATHE

MASTERLINE
GISHOLT SINCE 1887

This latest design Gisholt MASTERLINE Fastermatic Automatic Turret Lathe offers many outstanding features which give you faster, easier operation, higher quality work, quicker setup and lower maintenance. In short, this machine will do your work faster and better at less cost —and with a new minimum requirement for operator skill, effort and attention. May we give you more facts about its profitable application to your manufacturing processes?

**Gisholt Machine Company, Madison 10, Wisconsin**

***Look ahead—keep ahead—with Gisholt***



# BLAW-KNOX

## makes what it takes

## to hot roll high-tonnage

## top quality sheet

This CONTINENTAL 80-inch, 6-stand continuous hot strip mill in the United States Steel's Gary Sheet and Tin Mill was designed and engineered for heavy duty and high-speed finishing. It is well-known throughout the industry for excellent tonnage performance and quality.

In addition to these large mills, Blaw-Knox builds single-stand reversing hot strip finishing mills, complete with all auxiliaries.

Blaw-Knox designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

**BLAW-KNOX COMPANY**
*Foundry & Mill Machinery Division*
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

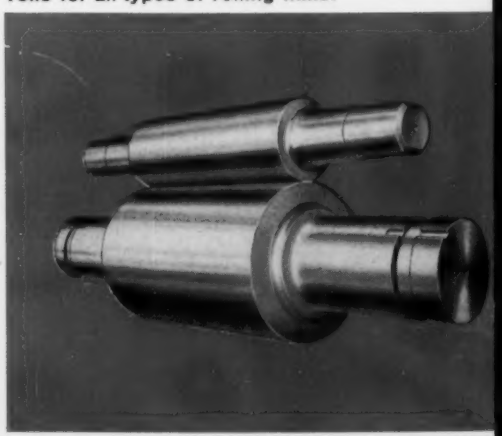
Complete rolling mill installations . . . including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills . . . roll lathes • chippers • special machinery • and complete auxiliary equipment

50th Anniversary
BLAW-KNOX
1906-1956

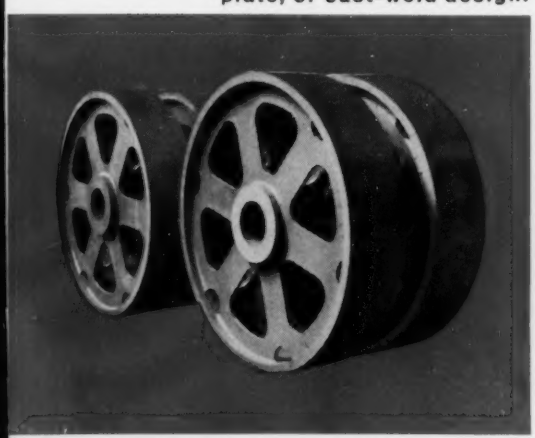
CONTINENTAL

**ROLLS**—Iron, alloy iron and steel rolls for all types of rolling mills.



**CONTINENTAL** 80-inch continuous hot strip mill in the Gary Sheet and Tin Mill of the United States Steel Corporation.

**WELDMENTS**—fabricated steel plate, or cast-weld design.



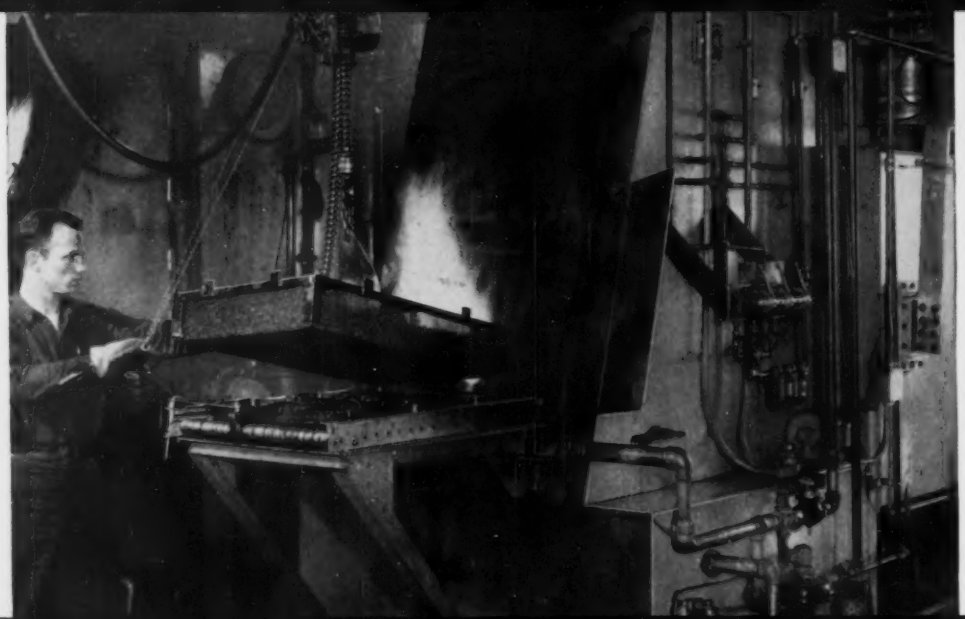
**CASTINGS**—carbon and alloy steel castings from 20 to 250,000 pounds.

## ALLIED

New Lindberg electric furnace with CORRTHERM element at Allied Metal Treating Corporation, Kenosha, Wisconsin. This furnace is used 24 hours a day, 6 days a week, for carbonitriding, clean hardening pinion gears, hardening crank shafts after carburizing and carburizing small gears and shafts.

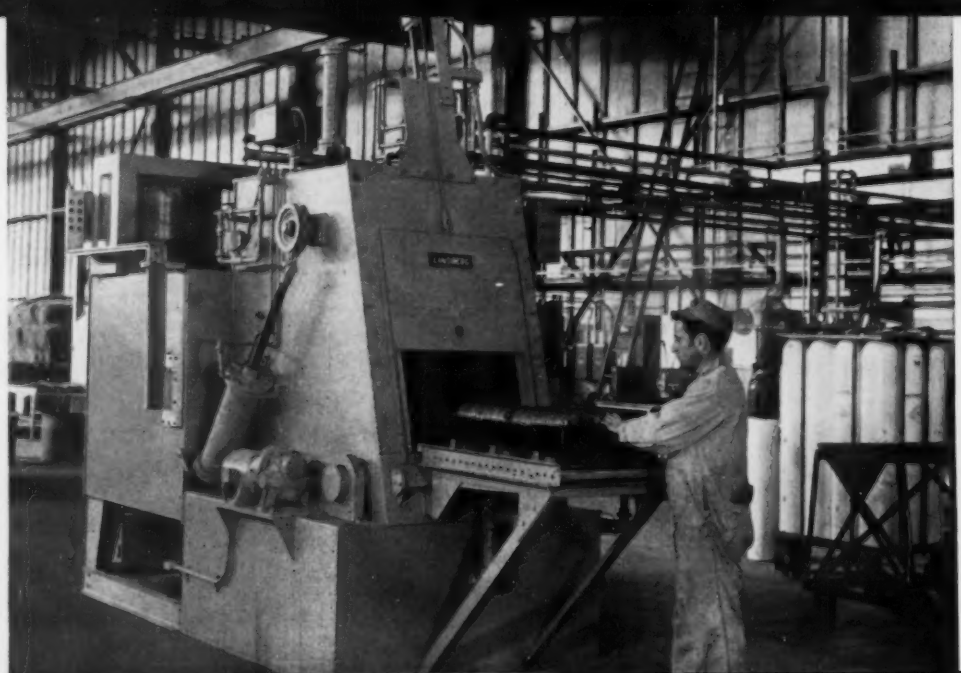
## EKLUND

Installation of new Lindberg furnace with CORRTHERM electric element at Eklund Metal Treating, Inc., Rockford, Illinois. Furnace used 24 hours a day, 7 days a week, for carburizing gears and machine tool parts, carbonitriding sheet metal screws and automotive parts, and hardening and tempering bolts.



## PERFECTION

Lindberg electric furnace with CORRTHERM element just installed at Perfection Tool & Metal Heat Treating Company's Lombard, Illinois plant. This furnace is being used 24 hours a day, 6 days a week, for carbonitriding and carburizing parts for automotive and farm implement industries.



# COMMERCIAL HEAT-TREATERS QUICK TO ADOPT LINDBERG ELECTRIC CARBONITRIDING FURNACES WITH NEW CORRTHERM HEATING ELEMENT

It is significant that commercial heat-treaters, always in the lead in the acceptance and development of better heat-treating methods, have been among the first to appreciate the revolutionary advantages of Lindberg's newly announced CORRTHERM electric heating element.

Recent Lindberg CORRTHERM-equipped furnace installations in plants of three leading midwestern commercial heat-treaters are shown on the opposite page.

Where electricity is the preferred source of heat Lindberg furnaces with CORRTHERM provide to the fullest degree the versatility and dependability required in efficient commercial heat-treating. Ideal for carbonitriding, they are readily applicable to other processes—carburizing, carbon restoration, bright hardening or annealing, and normalizing.

Whether your heat-treating operations are commercial or captive, large or small, the CORRTHERM element in Lindberg electric furnaces offers you these exclusive advantages:

**Low voltage**—operates at extremely low voltage. No leakage through carbon saturation.

**Atmosphere Circulation**—elements act as baffle to direct circulation of convection streams.

**Safety**—extremely low voltage eliminates shock or short hazards.

**Durability**—watts density at all time low. Element practically indestructible.

This shows how the new Lindberg CORRTHERM electric heating element fills the furnace with walls of glowing heat. Note also that CORRTHERM is conveniently hung from simple brackets requiring no complicated connections or construction.

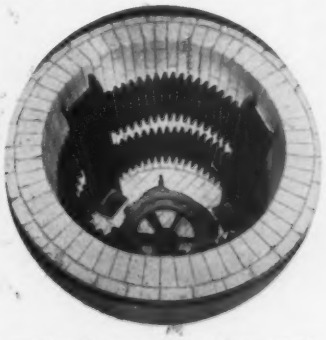
*CORRTHERM is an exclusive Lindberg development created in Lindberg laboratories by Lindberg metallurgists and engineers. To find out how its advantages can be applied to your heat-treating processes consult your nearest Lindberg Field Representative. (Look in classified phone book.)*

## LINDBERG ENGINEERING COMPANY

**2452 West Hubbard Street, Chicago 12, Illinois**

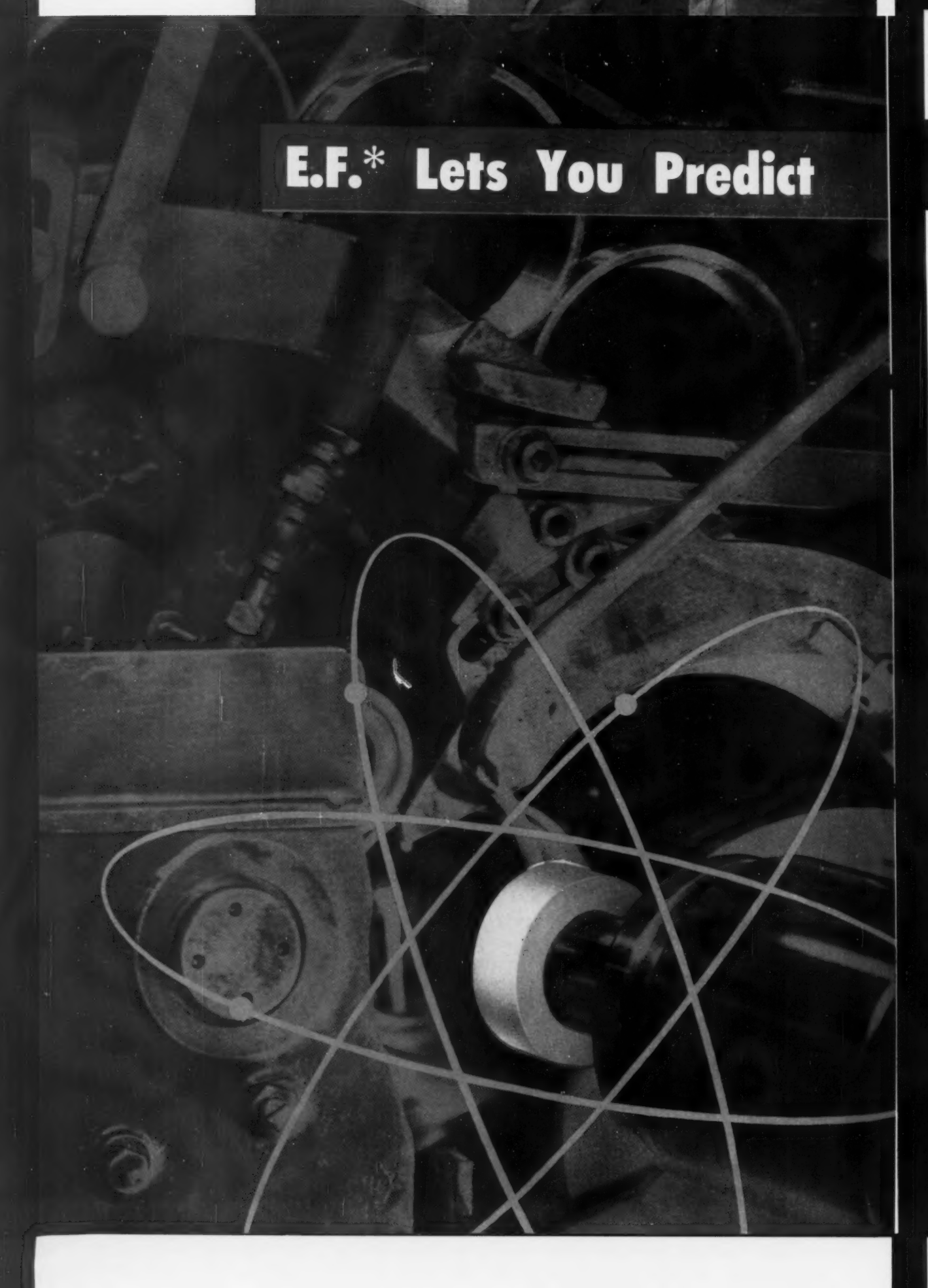
**Los Angeles Plant: 11937 Regentview Ave., at Downey, California**

Installation of CORRTHERM elements in one of two large rotary furnaces just erected in the field by Lindberg's associate company, Lindberg Industrial Corporation.



Installation of Lindberg CORRTHERM-equipped carburizing pit-type furnace in plant of Lindberg Steel Treating Co., Melrose Park, Ill.

Safety! Extremely low voltage makes CORRTHERM elements completely safe. Let operator or work load bang it if they will. Neither element nor operator will be hurt.


E.F.* Lets You Predict

company, Lindberg Industrial Corporation.

# Grinding Wheel Performance

* **ELECTRONIC FORMULATION is a basic manufacturing improvement which makes grinding wheel accuracy equal to the precision of automated production.**

When the output of machines like this centerless internal grinder feeds a production line . . . grinding wheels *must* maintain their prescribed production rates!
BAY STATE'S "EF" lets you predict such dependable grinding action because it offers:

**GREATER ACCURACY in selecting the right wheel for the finish and production rate you need.**
"EF" is based upon a new, straight-line progression of wheel hardnesses and structures. Specifications can be pin-pointed on this basic line within much closer tolerances.

**GREATER DEPENDABILITY of cutting life, giving a more reliable basis for predicting production per wheel.**

"EF' uses the unerring accuracy of an electronic "brain" to calculate *precise* amounts of each ingredient. These determine the grade and structure, hence the *performance* of the finished wheel.

**GREATER UNIFORMITY in cutting qualities of replacement wheels, for continuous production at most efficient rates.**

"EF" retains essential formula figures in the perfect "memory" of electronically punched cards. This assures identical duplication of materials in reproducing the wheels prescribed for your needs.

**GREATER CONSISTENCY in grade and structure, for steady flow of parts at "within tolerance" finish and dimensions.**

"EF" has established the most accurate standards by which grinding wheels can be specified, produced, and reproduced. It is your most logical source of complete confidence in production grinding wheels.

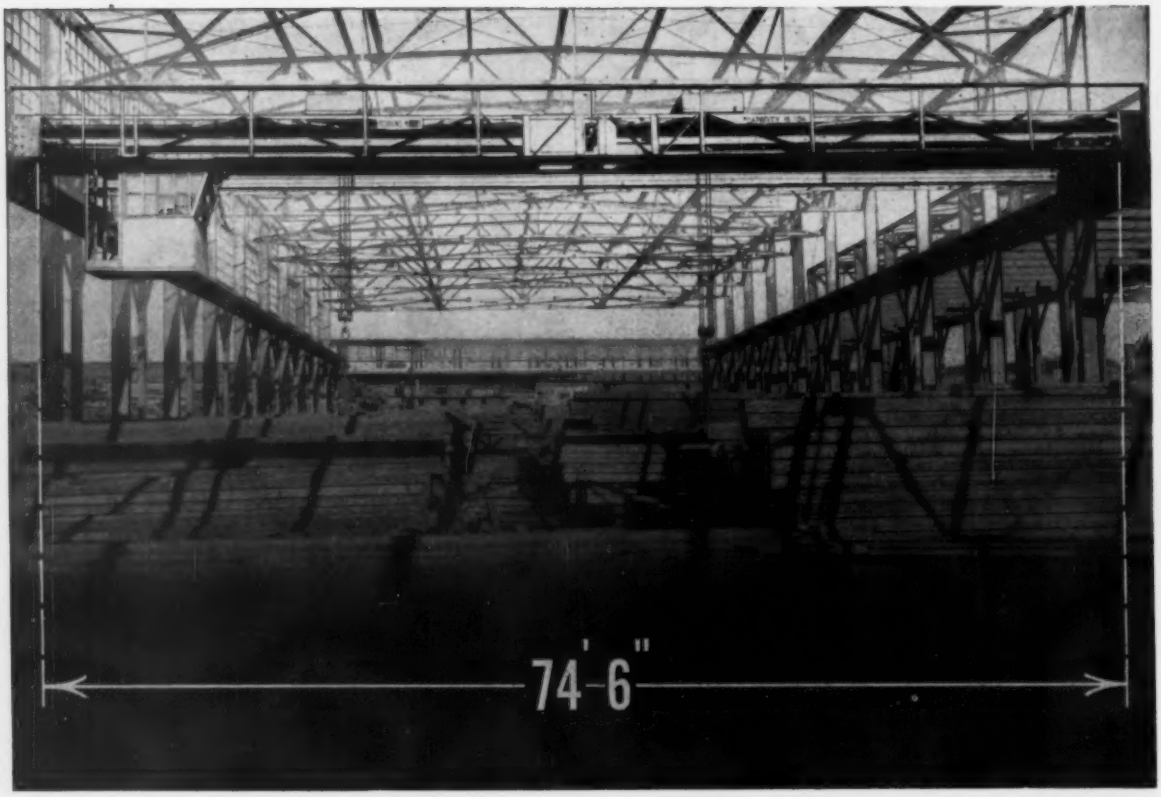
**Get ALL the E. F. benefits**
**See your BAY STATE Distributor!**

BAY STATE ®
WHEELS of PROGRESS

**BAY STATE ABRASIVE PRODUCTS CO.,**
**Westboro, Mass., U.S.A.**

Branch Offices and Warehouses — Bristol, Conn.; Chicago, Ill.; Cleveland, Ohio; Detroit, Mich.; Pittsburgh, Pa.
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co.(Canada) Ltd., Brantford, Ont.

TAKE IT UP WITH R&M HOISTS-CRANES-WINCHES




# BIG R&M CRANE MOVES STEEL FOR KILROY

The Material Handling Institute's Exposition Cleveland, Ohio Public Auditorium Sept 24 thru 28 1956 mhi BOOTH 1417

R & M built this big 15-ton crane to lift and move structural steel—never a dainty, packaged commodity—with two-handed flexibility. Two 7½-ton R & M Type "F" Hoists, independently controlled from the cab of this double-girder, five-motor crane, eliminate dangerous load-balancing.

Maximum bridge deflection (loaded), ½". End truck length, 15' 2", wheelbase, 11'. Bridge speed, 250 fpm maximum. Bridge control, six-step variable speed. Bridge brake, foot-controlled hydraulic. Hoist lift, 20'. Lift speed, 20 fpm. Trolley control, four-step variable speed to 125 fpm. Total crane weight, 60,000 pounds. User, Kilroy Structural Steel Company, Cleveland, Ohio.

Pictured at right—45-foot span, 20-ton capacity R & M crane with 5-ton auxiliary hoist. Standardized cranes in single or double I-beam types available quickly in 20 to 65-foot spans; capacities to 10 tons.

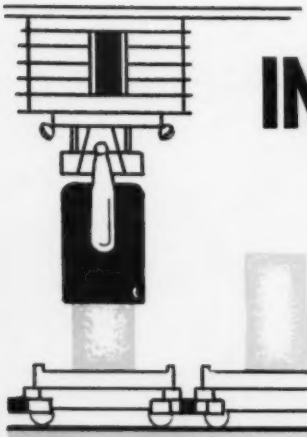
BRING YOUR R & M HOIST DATA FILE UP TO DATE. SEND FOR FREE BULLETIN.

☐ Have representative call ☐ Send Bulletin No. 825-B

VENTILATORS MOYNO PUMPS HOISTS CRANES MOTORS FANS

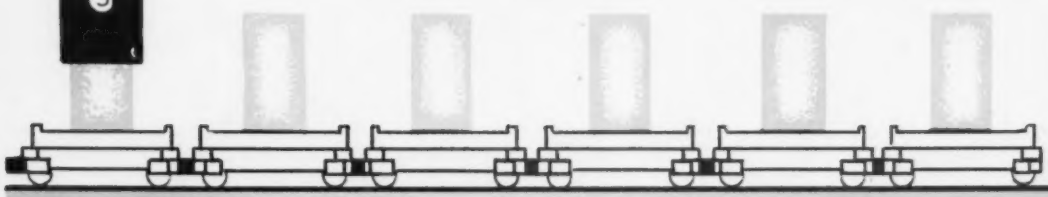
ROBBINS & MYERS INC.

SPRINGFIELD, OHIO BRANTFORD, ONTARIO



# INCREASE INGOT OUTPUT

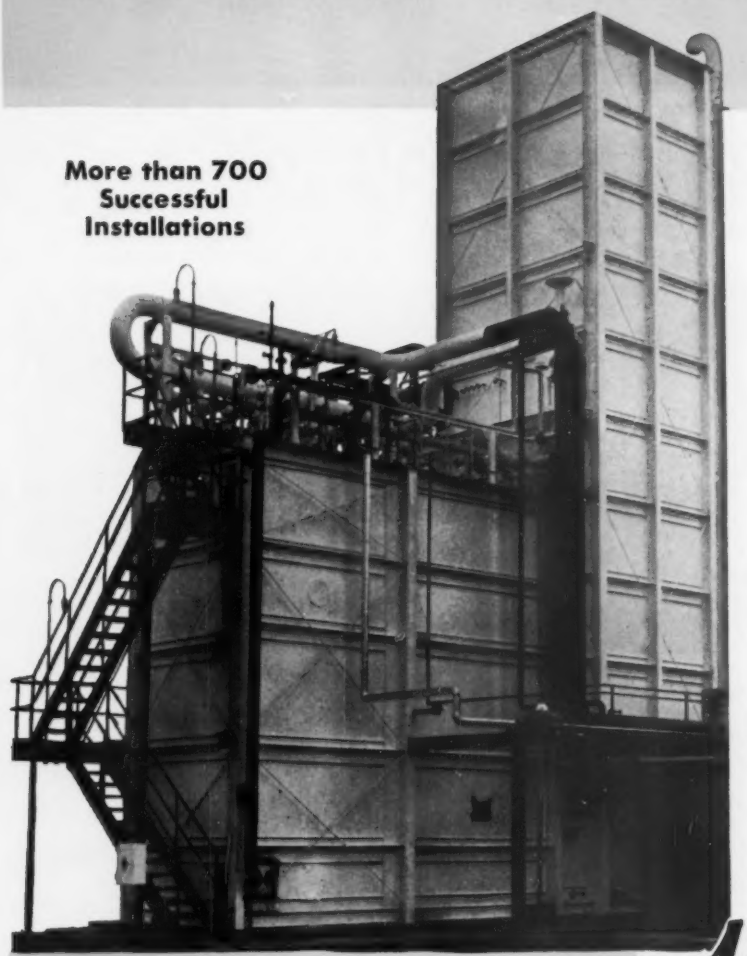
## *without capital investment*



*with*

# "ON-LOCATION" OXYGEN GENERATORS

**More than 700 Successful Installations**



Full utilization of oxygen in blast furnaces, open hearths and steel converters offers the Steel Industry the most economical means of increasing ingot output. And, of course, a captive generator is essential for the use of oxygen in adequate quantity.

We will furnish and install an "On-Location" oxygen and/or nitrogen generating station to suit your present and expanding oxygen requirements —on a lease basis (you can operate and maintain or Air Products will operate and maintain), with price guaranteed at all levels of consumption, *without capital investment by you.*

**We design and manufacture:**
**Generators for unlimited quantities of oxygen and nitrogen regardless of size, purity or cycle.**

If you will send us details regarding your requirements, we will give you a close estimate of the savings you can expect with Air Products "On-Location" Oxygen and/or Nitrogen Generators installed at your plant.

**LOW COST OXYGEN...NITROGEN**

*Air Products*
INCORPORATED
**Dept. I, Box 538, Allentown, Pa.**

# This is good housekeeping..

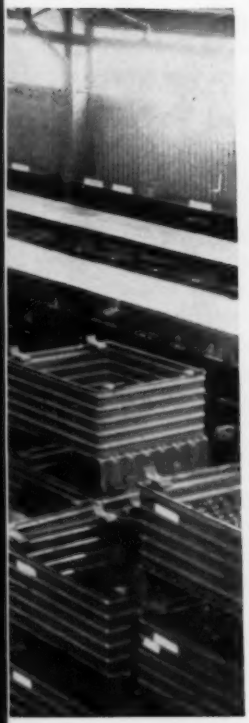
**GOOD HOUSEKEEPING MAY REQUIRE ADDITIONAL PLANT FACILITIES.** Republic's Truscon Division can supply you with those facilities in a standard steel building. Illustrated is one of many types and sizes produced by the world's largest manufacturers of metal building products. Truscon steel buildings offer the economies of standardization—plus fire protection, ease and speed of erection, low upkeep, high investment value. They're low in cost and additions can be made easily and economically as space needs change.

**GOOD HOUSEKEEPING CAN ALSO BUILD GOOD EMPLOYEE RELATIONS.** For example, modern steel lockers that conserve space and still provide clean, safe storage for employees' clothing and valuables are made by Republic's Berger Division. Illustrated is the Republic "Space-saver" two-person locker. It provides separate compartments for two people in no more floor area than that required for one large single-tier locker. Berger offers a complete locker planning, engineering and installation service.

**REPUBLIC**

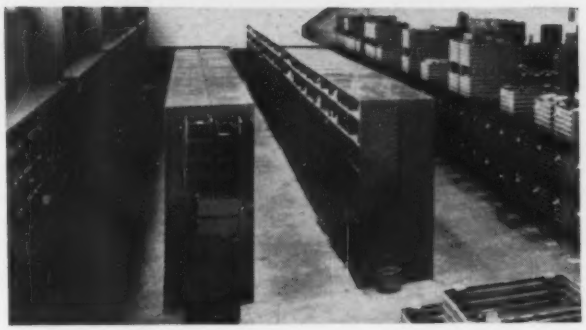
REPUBLIC STEEL

*World's Widest Range of Standard Steels*



**PB-120-T BOX AND SKID UNITS** used by Chiksan Company are equipped with welded tiering lugs which permit tiering to any practical height. Units are easily lifted and rapidly trucked to any point on the production line or in the warehouse.

**WEDGE-LOCK STEEL SHELVING** made by Republic's Berger Division assists Chiksan greatly in keeping more accurate records, uses less space and provides easy visible identification of parts. It is specifically designed for high stacking of enormous weights. Completely flexible, it assembles quickly and easily.



## HOW REPUBLIC MATERIALS HANDLING EQUIPMENT SAVED SPACE AND REDUCED HANDLING COSTS 25%

The above photos were taken in the Brea, California, plant of the Chiksan Company, makers of ball-bearing swivel joints. They have been using Republic Materials Handling Equipment for about eighteen months for both raw and finished materials.

Here are the results in the words of the Manager of Production and Material Control:

"Our experience is that much less space is required for storage of raw forgings and castings—which allows for better housekeeping and reduces handling costs 25%.

Inventories are much simpler and more accurate. Substantial time saving is realized.

Finished products are stored in both stack-type steel boxes and steel shelving. They assist greatly in keeping more accurate records, use less storage space and provide visible identification. We are able to do a better job with one less employee in the warehouse and to do good housekeeping with less effort.

The installation of these products was a wise and profitable investment."

Chiksan should enjoy future benefits as well. Maintenance costs should be reduced because construction features of all Republic Materials Handling Equipment assure long, efficient service at lowest per-year cost.

The PB-120-T Box and Skid Units illustrated on these pages are only one of many types manufactured by Republic's Pressed Steel Division. There is a wide range of sizes from which to choose. Or if you have a special handling problem, Republic engineers are available to help you design a unit to meet your specific requirements. Your Republic Materials Handling Equipment Dealer has all the facts. Or write us for more information.

The Material Handling Institute's Exposition Cleveland, Ohio Public Auditorium June 5th Thru 8th 1956 mhi EXHIBITOR

**SEE OUR EXHIBIT AT THE EXPOSITION—BOOTHS 900-902**

# STEEL

*and Steel Products*

**REPUBLIC STEEL CORPORATION**
**Dept. K-8678-A**
**3104 East 45th Street**
**Cleveland 27, Ohio**

Please send more information on:
☐ Republic Boxes and Skids ☐ Truscon Steel Buildings
☐ Berger Wedge-Lock Steel Shelving ☐ Berger Lockers

Name_____ Title_____

Company_____

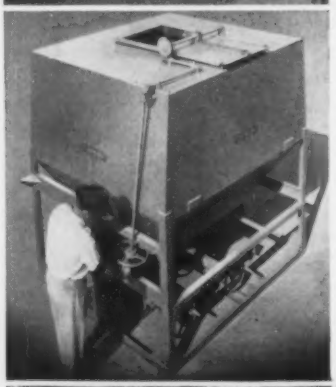
Address_____

City_____ Zone____ State_____

# Briefly, this ad illustrates why DEMPSTER-DUMPSTER SYSTEM

Container at right has cast iron bottom and inside walls are lined with fire brick. It handles hot skim off aluminum.

This Tilt Type Container was the result of a cost-cutting idea whereby a high temperature dusty product would be handled by a plant's Dempster-Dumpster. Container has cooling fins, counter-balanced hinged lid with 3-way locking device, 16" sliding gate valve and two sight-glass inspection openings.



Here is a Hopper Type Container with a top door for filling and two bottom discharge doors operated by rack and pinion. Another case where the Dempster-Dumpster System was applied to an additional problem to further reduce costs.

Container at right is just one of several different types we have designed to handle equipment, materials, packages, parcels, etc.

IN A NORMAL INSTALLATION the Dempster-Dumpster System is purchased by a plant because of its proved record for handling bulk materials at tremendous savings. This normal installation usually includes one truck mounted Dempster-Dumpster and any number of standard containers designed to meet the various requirements within the plant. In some cases, containers number 40 to 50. These containers can range in capacity up to 21 cu. yds., with all containers served by the one Dempster-Dumpster.

In the great majority of cases this basic installation is just a starter. Management men, constantly looking for lower operating costs, find numerous and amazing extra savings in the Dempster-Dumpster System. Once in service, transporting developments of every description come to light that supplement the original functions of the equipment. Your own men find easier, quicker and additional cost saving ideas for its use. Many even overshadow the original savings and the equipment becomes more and more indispensable.

Look over just a few of the "Special" containers illustrated in this ad. They are all the result of rough ideas that originated with the men in plants after a basic installation, then developed by our engineers. All ideas were stimulated by the powerful Dempster-Dumpster and its flexibility in picking up, hauling, setting down or dumping anything that needs transporting, at lower cost.

One man, the driver, and a few simple hydraulic controls in the cab of a Dempster-Dumpster, will become indispensable in your plant. It is just that in hundreds of plants of every description throughout the nation. Let one of our representatives give you details of installations. Manufactured exclusively by Dempster Brothers, Inc.

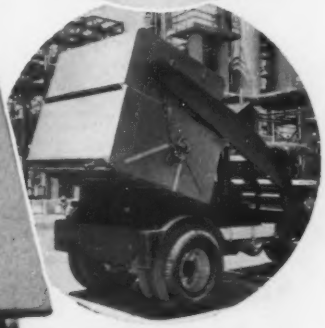
Above container is built with cast iron liner. The holes in outer wall are for cooling.

Here is one of several special drop bottom type containers equipped with couplers and ball bearing trucks for operation in train on rails.

THE DEMPSTER DUMPSTER SYSTEM

**DEMPSTER BROTHERS**

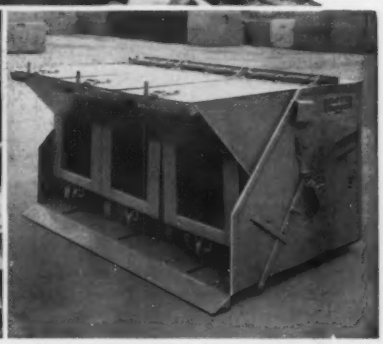
# so many plants find the indispensable...



Two photos above show how all containers, regardless of design, are picked up and hauled. At destination materials are dumped from drop bottom containers as shown at left . . . from Tilt and Skip Type Containers by tilting. Any load, of course, may be set down intact.

This is a special adaptation whereby waste zinc slurry is pumped into two containers, which serve as settling tanks, enabling majority of the water to be decanted before sludge is transported and dumped at waste basin.

Tank Type Containers are available with or without casters in steel, aluminum, stainless steel, etc. Capacity ranges up to 1,200 gal. They may be lined with rubber, lead, highly resistance coatings, etc.



This is a master container with three 2 cu. yd. insert containers. Each insert container is provided with casters, counter-balanced spring-hinged lid for loading and dumping.

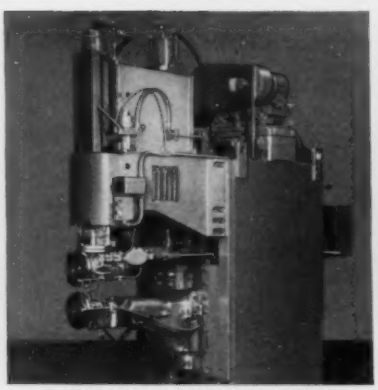
**456 North Knox, Knoxville 17, Tennessee**

# THOMSON

**HANDLE RECEIVERS** are attached to stainless steel pans — a typical projection welder application. Result: high production, low unit cost, strong welds, no marring of high finish.

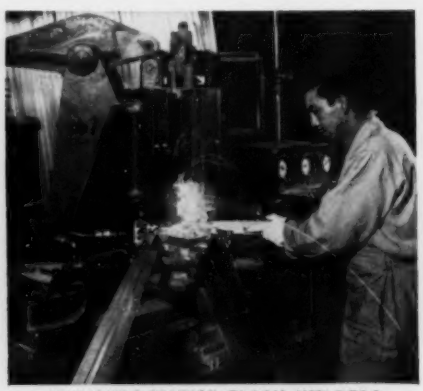
**NEW SPOT WELDERS**

Model RA Spot Welders extend the complete line—provide low cost equipment for utility or production work.



**THOMSON SEAM WELDERS**

Sizes range from 50 to 400 KVA. Models for circular, longitudinal or universal seaming to exacting specifications.



**"SYNCHRO-MATIC" FLASH WELDERS**

This exclusive THOMSON development has set new standards for flash-butt welding nonferrous as well as ferrous metals.

# specialists in the broad field of RESISTANCE WELDING EQUIPMENT

The THOMSON line is truly complete — ranging from simple, low cost, standard machines to highly specialized production welding equipment. It includes all standard resistance welding types — spot, projection, seam and flash-butt — as well as electro-brazing, electro-forging, upsetting and related equipment.

THOMSON also offers complete engineering, laboratory and experimental facilities to help develop the most effective welder for any application — plus an organization of capable representatives in all metalworking centers to make this service conveniently available to you.

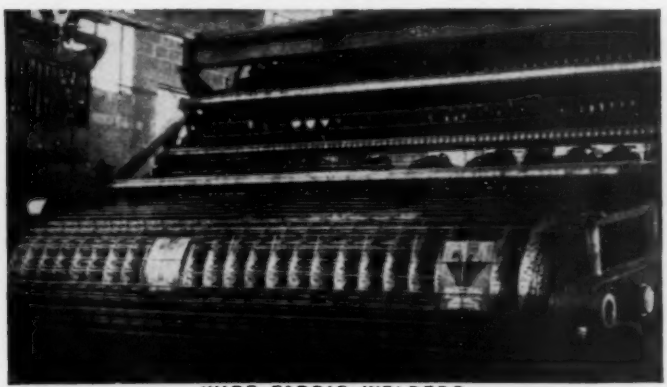
Keep THOMSON in mind when you need resistance welding equipment, technical assistance or the recommendations of the foremost resistance welding specialists.

FOUNDED IN 1886 BY ELIHU THOMSON

INVENTOR OF RESISTANCE WELDING

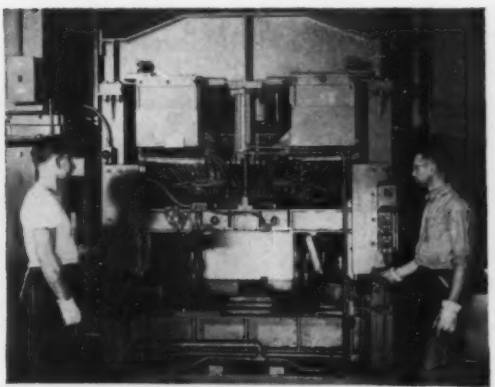
**THOMSON *Welders***

THOMSON ELECTRIC WELDER COMPANY, LYNN, MASS.



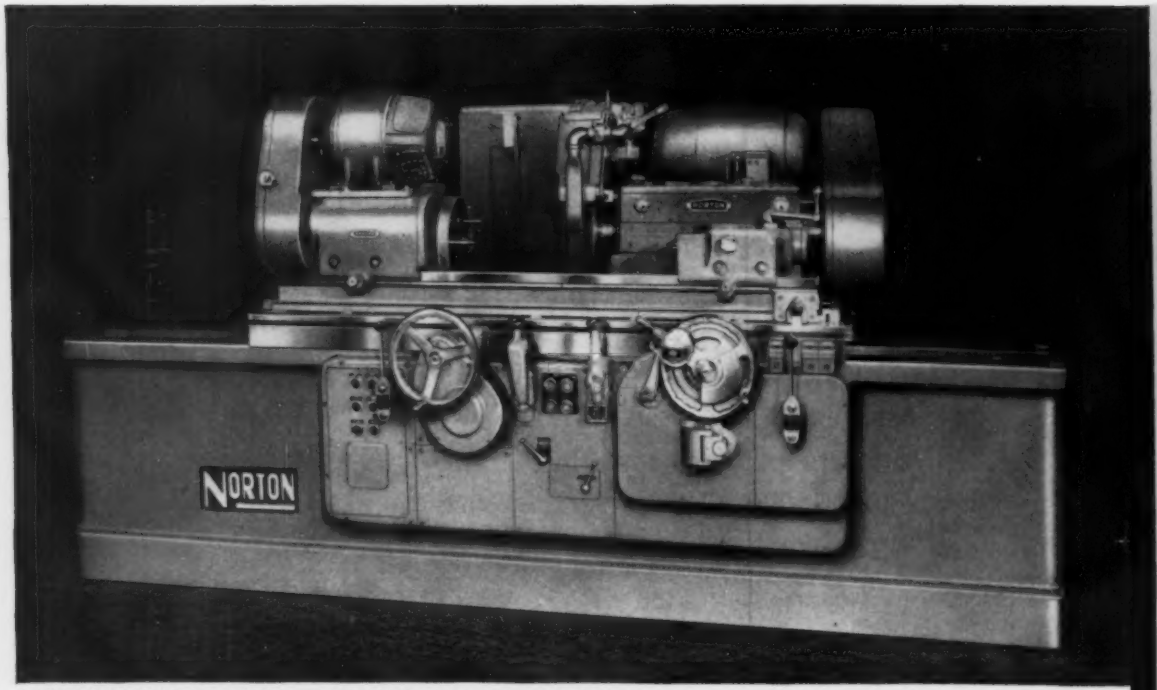
**WIRE FABRIC WELDERS**

Typical of the many special THOMSON designs which have become standard in their fields of application.



**SPECIAL PURPOSE WELDERS**

Designed to do one job in the most effective, economical way. Automation applied to resistance welding.




**A NORTON TYPE CTU SEMIAUTOMATIC CYLINDRICAL GRINDER.** The fastest, most economical and versatile grinding machine of its type. One-lever control of the automatic grinding cycle reduces the operator's duties to loading and unloading. Both the 6″ and 10″ Type CTU's are available as semiautomatics or as plain machines.

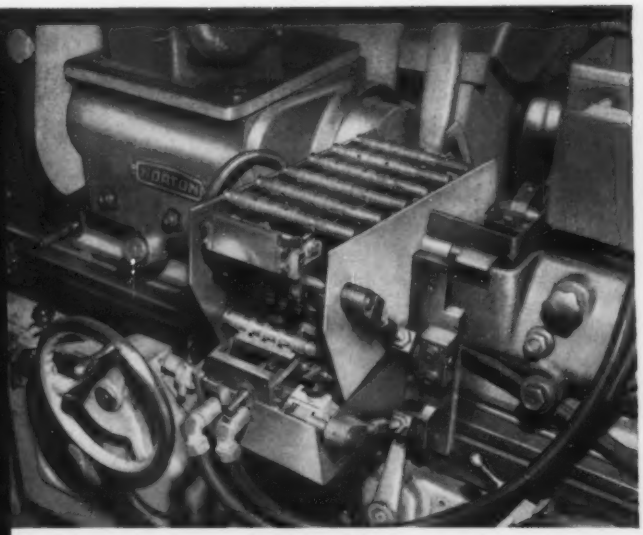
# Norton Type CTU Cylindrical Grinders are packed with features for...

Production line and job shop users report that Norton 6″ and 10″ Type CTU cylindrical grinders have doubled and tripled production, replaced several machines and eliminated costly extra operations.

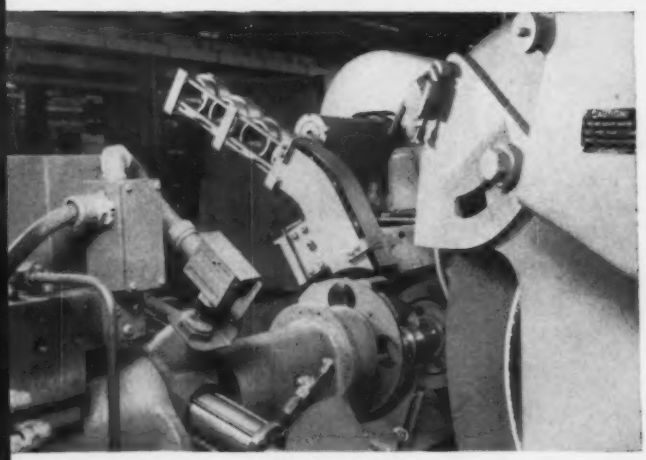
That's because of the many time-and-work-saving "Touch of Gold" features — standard and auxiliary — available with these grinders.

Some of the expertly automated auxiliary features are described here. Check them carefully — and figure their value to your own cylindrical grinding operations. And remember: only Norton offers you such long experience in both grinding machines and wheels to bring you the "Touch of Gold" that helps you produce more at lower cost. For further facts, see your Norton Representative, or write to NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

**THE SWIVALIGN* ELIMINATES CUT-AND-TRY.** Another Norton "Touch of Gold" development for faster, better, lower cost grinding. The SWIVALIGN Dual Electric Indicator, available for Norton cylindrical and universal grinders, enables operators to adjust the angular positions of swivel tables quickly and accurately, eliminating the usual cut-and-try guesswork. Featuring positive response and easy operation, this accurate instrument saves grinding time and money.

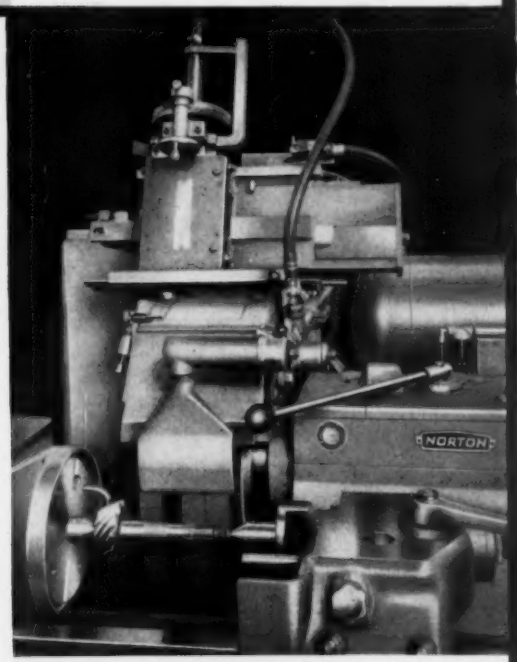



*RAIL TYPE*



*TURRET TYPE*

**YOUR CHOICE OF AUTOMATIC LOADING DEVICES.** Two types of Norton automatic loading devices are obtainable with 6" and 10" Type CTU semiautomatic grinders. The rail type loader is designed to handle a variety of small shafts. The turret type loader handles workpieces which must be chucked. Thanks to their steadily paced, automatic operation these Norton-developed loading mechanisms can be adapted to full automation. Or, they make it possible for one operator to tend a battery of machines, speeding production and cutting unit costs day after day.




**WHEEL HEAD MOUNTED AUTOMATIC TRUING OFFERS BIG ADVANTAGES.** A Norton automatic truing device, as shown here on a Type CTU grinder, quickly repays its original cost. It speeds up production, increases wheel life and increases diamond life. Also, it decreases the skill and effort required with hand truing. Operation is extremely simple. Once the original settings are made, all you do is push a button. Then the diamond automatically makes its round trip across the wheel face, at pre-determined speed and feed. Easy adjustments assure correct settings for each job . . . Another step forward in automatic grinding!

**NORTON**

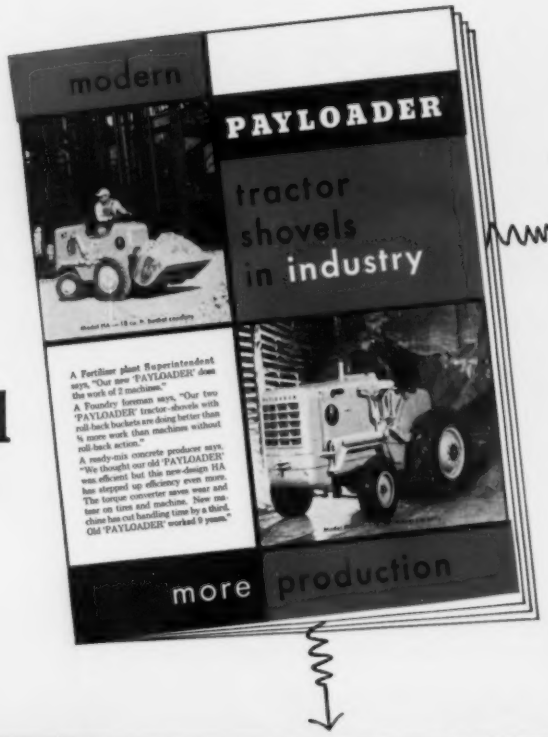
**GRINDERS and LAPPERS**

*Making better products . . . to make your products better*

*District Offices:* Worcester • Hartford • New York Area, Teterboro, New Jersey • Cleveland • Chicago • Detroit

*SWIVALIGN — Norton trade name for Dual Electric Indicator for accurate measurements of swivel table adjustment.

# get these first-hand reports of profitable bulk-material handling methods


modern
PAYLOADER
tractor shovels in industry
A Fertilizer plant Superintendent says, "Our new 'PAYLOADER' does the work of 2 machines."
A Foundry foreman says, "Our two 'PAYLOADER' tractor-shovels with roll-back buckets are doing better than ⅓ more work than machines without roll-back action."
A ready-mix concrete producer says, "We thought our old 'PAYLOADER' was efficient but this new-design HA has stepped up efficiency even more. The torque converter saves wear and tear on tires and machine. New machine has cut handling time by a third. Old 'PAYLOADER' worked 9 years."
more production

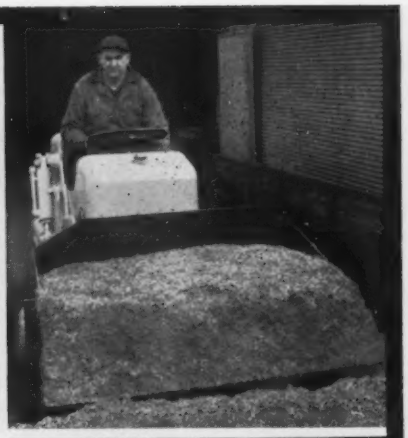
## *Roll-back bucket action does 1/3 more work at OHIO STOVE CO.*

Before buying these two model HA "PAYLOADER" units for its foundry, Ohio Stove Company tried other equivalent-size loaders. In their own words, "the 'PAYLOADER' came way out on top. The two new design HA's with roll-back buckets are doing better than ⅓ more work than machines without roll-back action."

Ohio uses these machines to handle hundreds of tons of sand and castings daily—to scoop up sand and castings from all over the pouring floor, delivering the mixture to the shake-out in ton loads . . . also use them to deliver sand to molder's stations.

## *Versatility pays off at* MUELLER BRASS CO.

The usefulness of a "PAY-LOADER" is only limited by the imagination of its owners. Designed primarily for fast handling of bulk or loose materials, it nevertheless is a jack of all jobs in many plants. Mueller Brass Co. uses its model HA's to unload trucks and car loads of brass and copper scrap and turnings—to handle drums and baled material—to remove snow . . . in fact, for all sorts of odd but important jobs in addition to the regular sand handling duties in its foundry.



More than 35 years of experience in tractor-shovel design and application has been built into "PAYLOADER" units by The Frank G. Hough Co., originators of the unit-design tractor-shovel. It is this vast experience and knowledge incorporated into the design of each "PAYLOADER" model that makes the big difference in its superior performance on any job.

The new "PAYLOADER" Models HA and HAH include many exclusive features which pay off in greater output per hour. They are small and compact for easy maneuvering and handling in close quarters, yet have ample dumping height for most any job. The 40° bucket roll-back gets full loads fast and, combined with the hydraulic shock absorber, enables the "PAYLOADER" to carry full loads in a higher gear without spillage. These two features are BIG reasons why these machines give more production than heavier machines with bigger engines.

The full-reversing transmission and torque converter provide a wide range of easily obtainable speeds and maximum efficiency in handling each load. Extremely rugged construction . . . finest quality in each component—assures continuous performance with a minimum of "down-time" and a longer useful life.

**PAYLOADER®**
MANUFACTURED BY
**THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.**
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

It's the difference in performance that has made the "PAYLOADER" the decided choice in thousands of plants throughout the world —there are more in service today than all other makes combined. A "PAYLOADER" is your best investment now — and for the future.

**THE FRANK G. HOUGH CO.**
733 Sunnyside Ave., Libertyville, Ill.

- ☐ Send profitable bulk-handling reports
- ☐ Literature on model HA (1⅛ cu. ft.) and model HAH (1 cu. yd.) "PAYLOADER"
- ☐ Literature on larger units to 2¼ cu. yd.

Name_____
Title_____
Company_____
Street_____
City_____
State_____

# MUELLER BRASS CO.
# improves LENSOMETER
# lower cost

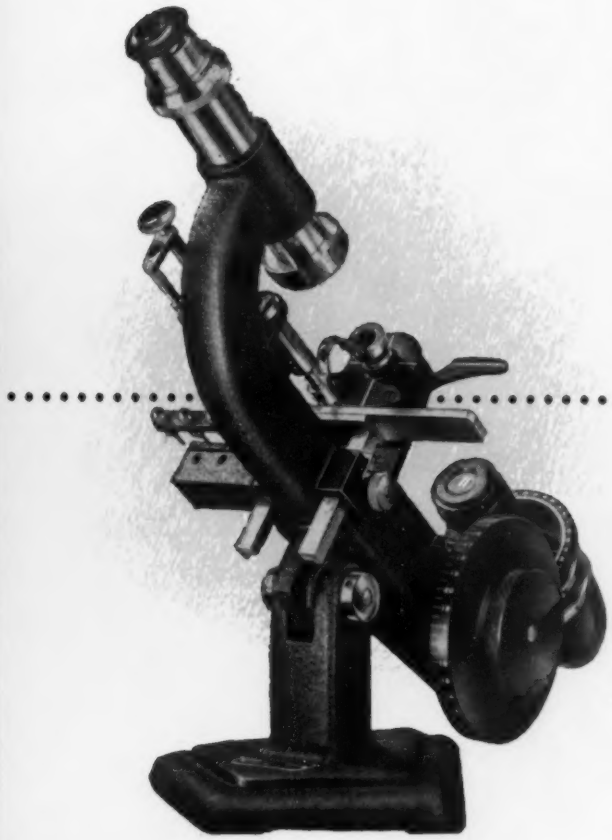
FORGED PART APPROXIMATELY ⅛ SIZE

Precision and extreme accuracy are vitally important functions of the Lensometer, manufactured by the Instrument Division of the American Optical Company, Buffalo, N. Y. The Lensometer is used to determine the focal strength and axis of an optical lens and, consequently, must be extremely precise in operation to provide accuracy and uniformity in lens prescriptions.

Forgings made by the Mueller Brass Co. play an important role in the construction of the Lensometer and contribute to its outstanding performance. Formerly, the body of the Lensometer was produced from *three* sand castings, but these now have been replaced by just *two* forgings. Naturally, this simplifies assembly, and the big forged bronze main support arm, shown above, along with the lens support bracket insures the constantly accurate alignment of the instrument. During the first year when forgings were used instead of castings, American Optical not only recovered the initial tooling costs but also realized considerable savings on each Lensometer produced. This is another good example of the way Mueller Brass Co. forgings can benefit a product two ways . . . better performance and lower costs. Chances are, your product can likewise be improved at a savings to you if you specify brass, bronze or aluminum forgings made by the Mueller Brass Co.

# FORGING

# at substantially



• WRITE TODAY FOR THE ENGINEERING MANUAL YOU NEED

Mueller Brass Co. Forgings Engineering Manual H-58565 ☐

Tuf-Stuf Aluminum Bronze Alloys Engineering Manual H-58563 ☐

600 Series Bearing Alloys Engineering Manual FM-3000 ☐

Copper Base Alloys in Rod Form Engineering Manual FM-3010 ☐

## METALS AND ALLOYS REVIEW

by FRANK M. LEVY

Vice-President and Director of Research

One of our most interesting series of alloys is the group which we market under the tradename "Tuf-Stuf" . . . a group of aluminum bronze alloys with range and flexibility to meet the most demanding needs. They are high copper base alloys containing from 9% to 13% aluminum and varying amounts of iron, nickel and manganese. Being free of zinc, they are not subject to dezincification. Tuf-Stuf alloys have a low coefficient of friction, good wearing qualities, high tensile strength, high hardness and the ability to withstand heavy pounding. Some of the alloys can be hardened by heat treatment. In the harder grades, these alloys are used for heavy duty service where high compressive loads are encountered and where lubrication may be scant. Present day increases in operating speed of modern machine equipment and the economy of little or no machine "down" time has made Tuf-Stuf popular in the machine tool industry. It is used in a multitude of applications where resistance to wear is important, such as: Drill Jigs, Feed Nuts, Rollers, Cams, Collets, Gibs, Gears, Boring Bar Guides, Lead Screw Nuts and Clutch Shifter Forks. Also, because of their ability to withstand higher stresses and resist season-cracking, these alloys are ideally suited for threaded nuts and bolts and pole-line hardware.

The unusual physical properties of the Tuf-Stuf series have made it particularly useful in the chemical and allied industries. These alloys combine the strength and ductility of medium steel with high resistance to corrosion by many chemicals. Tuf-Stuf alloys will not only resist oxidation at elevated temperatures, but will also retain a greater portion of their strength and hardness at these temperatures than will the copper zinc alloys. These properties make them ideal in the aircraft industry for valve seat inserts, spark plug bushings, valve guides and propeller hub cones.

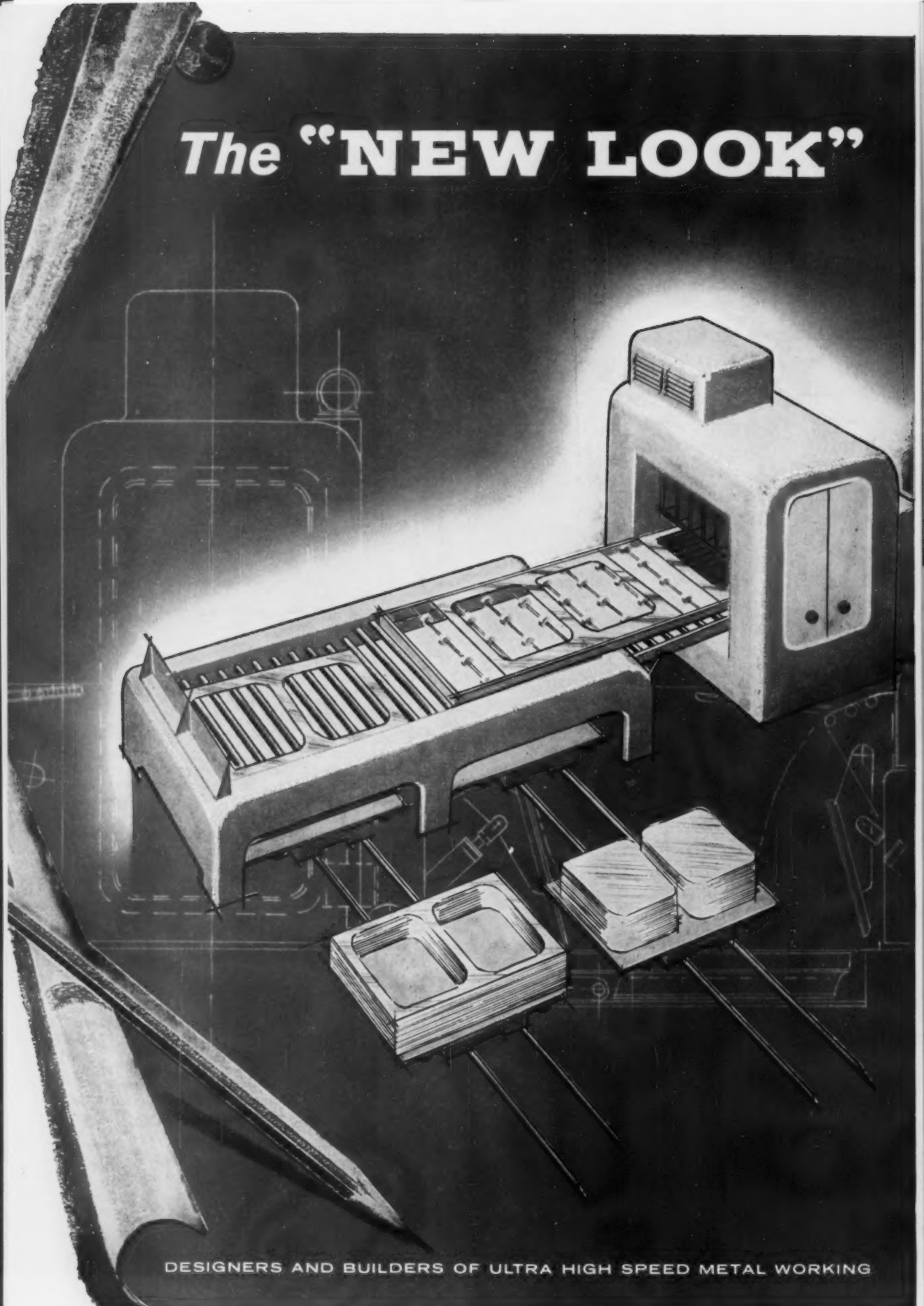
Tuf-Stuf alloys are supplied as forgings, rod or screw machine products. As forgings the grain structure can be controlled to produce parts that are strongest at points of greatest stress and strain. Relatively intricate shapes can be forged to closer tolerances than sand castings. Where appearance is a factor, a forging may easily prove more economical since a minimum amount of machining, buffing or polishing is required before finishing.

If you'd like more information about this series of alloys, drop me a line or better yet, send me your sample part or blueprint and an explanation of its use and we'll be glad to submit our recommendations.

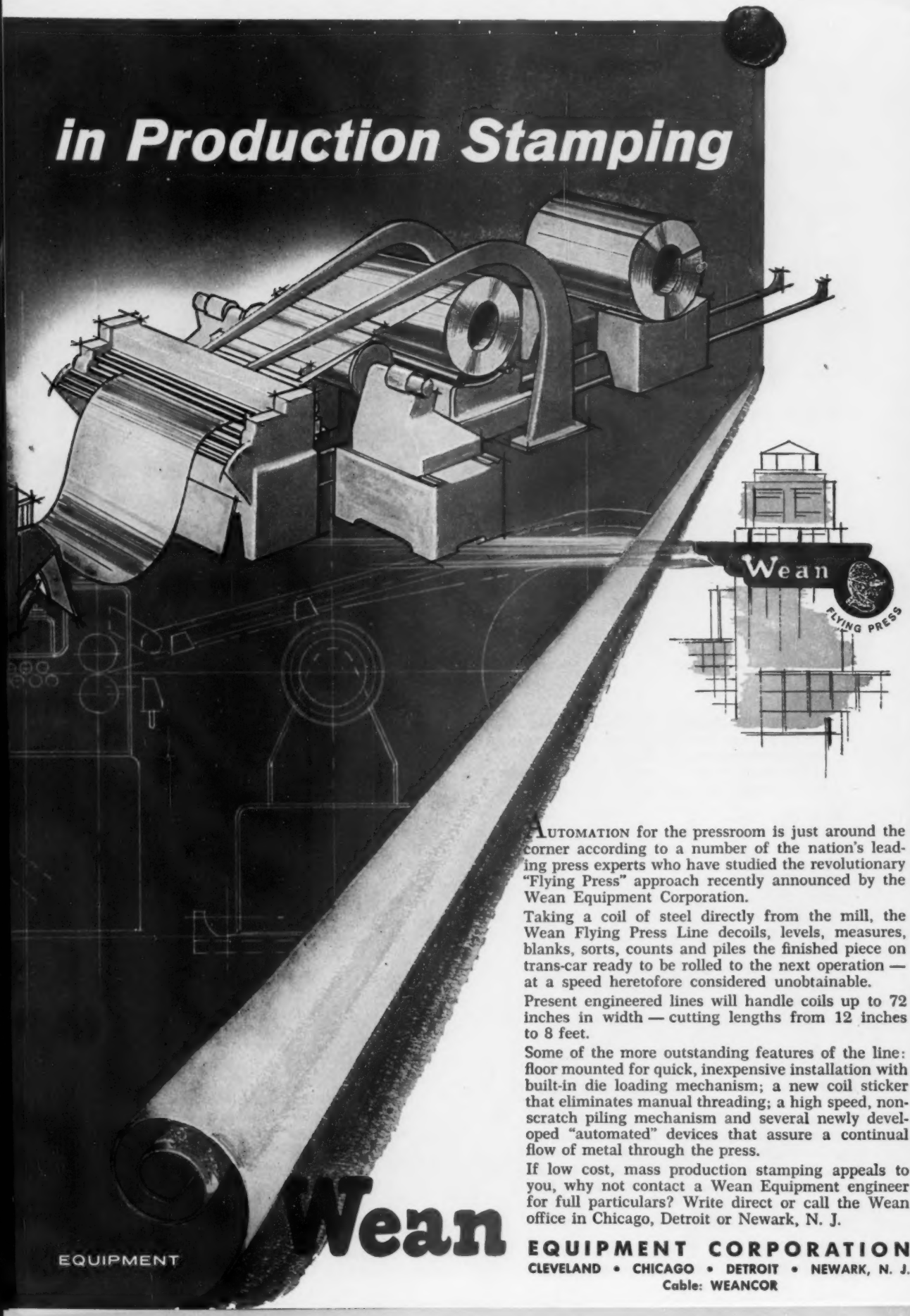
# MUELLER BRASS CO.

PORT HURON 24, MICHIGAN

178


The "NEW LOOK"
DESIGNERS AND BUILDERS OF ULTRA HIGH SPEED METAL WORKING

# in Production Stamping




AUTOMATION for the pressroom is just around the corner according to a number of the nation's leading press experts who have studied the revolutionary "Flying Press" approach recently announced by the Wean Equipment Corporation.

Taking a coil of steel directly from the mill, the Wean Flying Press Line decoils, levels, measures, blanks, sorts, counts and piles the finished piece on trans-car ready to be rolled to the next operation — at a speed heretofore considered unobtainable.

Present engineered lines will handle coils up to 72 inches in width — cutting lengths from 12 inches to 8 feet.

Some of the more outstanding features of the line: floor mounted for quick, inexpensive installation with built-in die loading mechanism; a new coil sticker that eliminates manual threading; a high speed, non-scratch piling mechanism and several newly developed "automated" devices that assure a continual flow of metal through the press.

If low cost, mass production stamping appeals to you, why not contact a Wean Equipment engineer for full particulars? Write direct or call the Wean office in Chicago, Detroit or Newark, N. J.

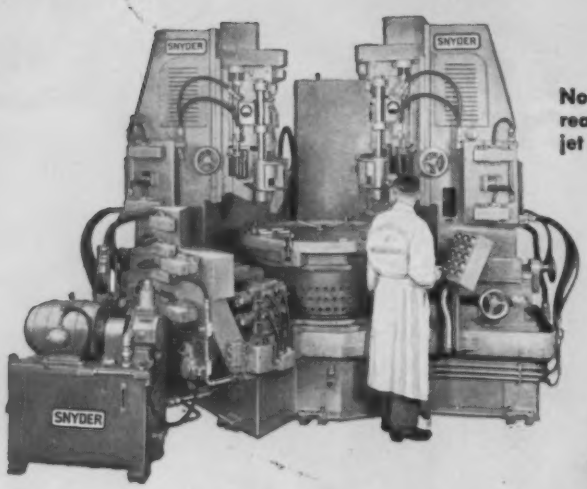
EQUIPMENT

**Wean**

**EQUIPMENT CORPORATION**

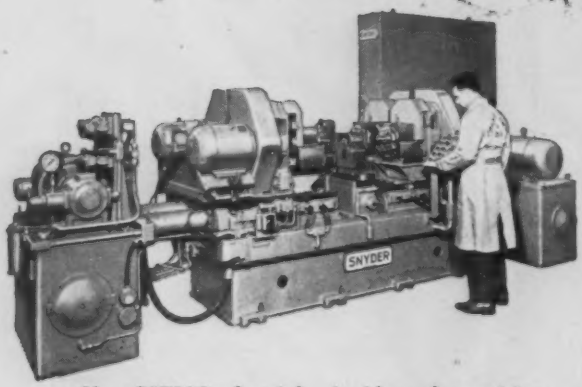
**CLEVELAND • CHICAGO • DETROIT • NEWARK, N. J.**

**Cable: WEANCOR**

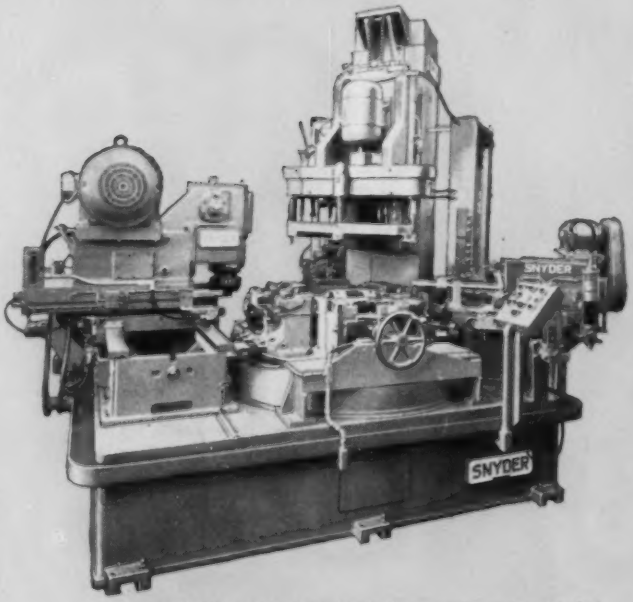



**No. 70165—Special index machine to drill and ream holes in rims of outer shroud spacers for jet engines. Production 2 parts per hour.**

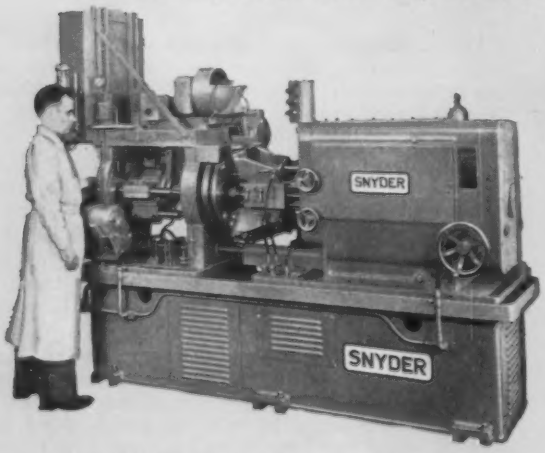
**No. 65412—Special automatic machine, for weighing and precision balancing a variety of heavy-duty and diesel engine connecting rods from 7⅜" to 12" center distance. Weighs rods and automatically balance mills to plus or minus 2 grams.**




**No. 207390—Special, double-end precision boring machine for finish boring, counterboring and chamfering counter shaft, intermediate and shifter shaft holes on power take-off cases. Production 82 pieces per hour at 80% efficiency.**




**No. 73902—Special 4-station automatic index machine for milling joint face, drilling and reaming vertical and horizontal holes in exhaust manifolds. Production 80 pieces per hour at 80% efficiency.**




**No. 68526—Special double end trunnion machine, fully automatic, for machining special aircraft rivets. Machine is automatically loaded and unloaded. Production rate varies with size of rivet.**

Cable: WEANCOR

# SNYDER VERSATILITY

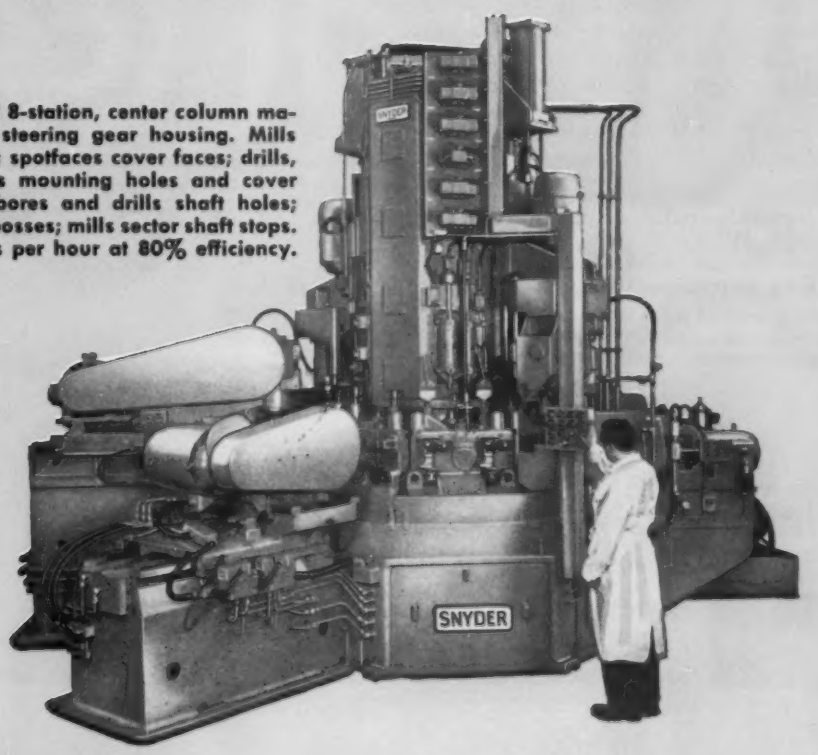
**in engineering and building metal-cutting machines includes not only the great Snyder line transfer machines with automation, but also many smaller and diversified machines in which the standards of performance and economy are no less exacting. A few representative examples are shown.**

# SNYDER

## TOOL & ENGINEERING COMPANY

**3400 E. LAFAYETTE • DETROIT 7, MICHIGAN**

*31 Years of Special Machine Tools with Automation*




**No. 72976½—Special 8-station, center column machine for processing steering gear housing. Mills pads and cover faces; spotfaces cover faces; drills, countersinks and taps mounting holes and cover holes; rough counterbores and drills shaft holes; mills two Welch plug bosses; mills sector shaft stops. Production 260 pieces per hour at 80% efficiency.**

## GET EXTRA SUB-HEARTH

# SAFETY AND LONGER LIFE

## WITH KAISER PERICLASE D-S BRICK →

THIS superior brick has been *especially designed* to withstand sub-hearth conditions. Thus, it gives maximum protection against costly breakthroughs and provides longer sub-hearth life.

Steel men agree on the important properties for a sub-hearth brick. They are all found in Kaiser Periclase D-S Brick.

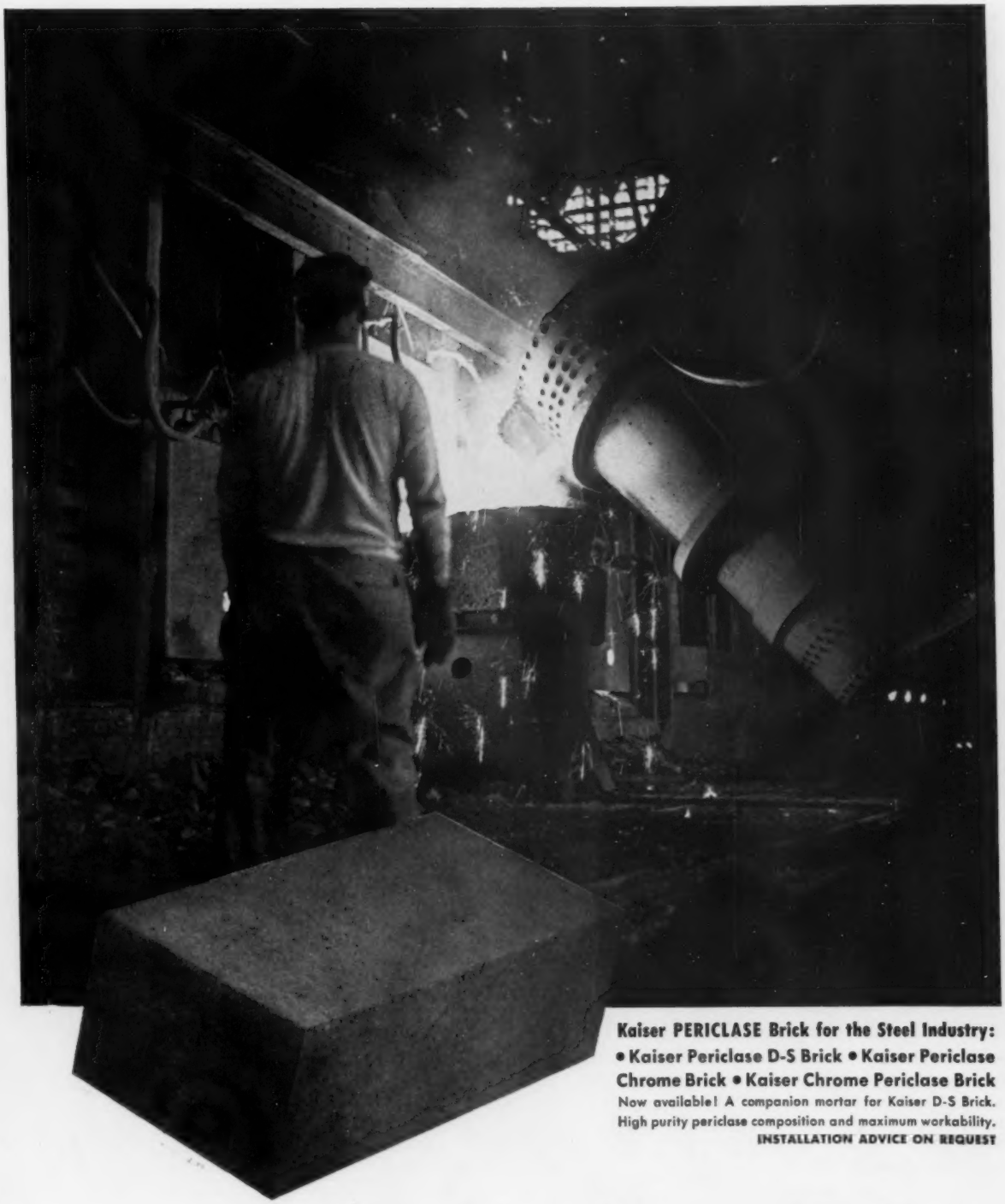
High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately sized Periclase grains derived from sea-water magnesia. Absence of chrome eliminates the reduction of chromium oxide and damage to the refractory structure.

Low iron content minimizes refractory damage from alternate oxidation and reduction of iron oxide and other iron compounds. Absence of calcium oxide prevents damage caused by slaking during slow heat-ups or while furnace is idle.

With all its many advantages, Kaiser Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, Calif. . . . 3 Gateway Center,* PITTSBURGH, *Pa. . . . 518 Calumet Building, 5231 Hohman Ave., Hammond, Indiana* (CHICAGO).

## For the ultimate in steel furnace refractories



**Kaiser PERICLASE Brick for the Steel Industry:**
**• Kaiser Periclase D-S Brick • Kaiser Periclase Chrome Brick • Kaiser Chrome Periclase Brick**
Now available! A companion mortar for Kaiser D-S Brick. High purity periclase composition and maximum workability.
**INSTALLATION ADVICE ON REQUEST**

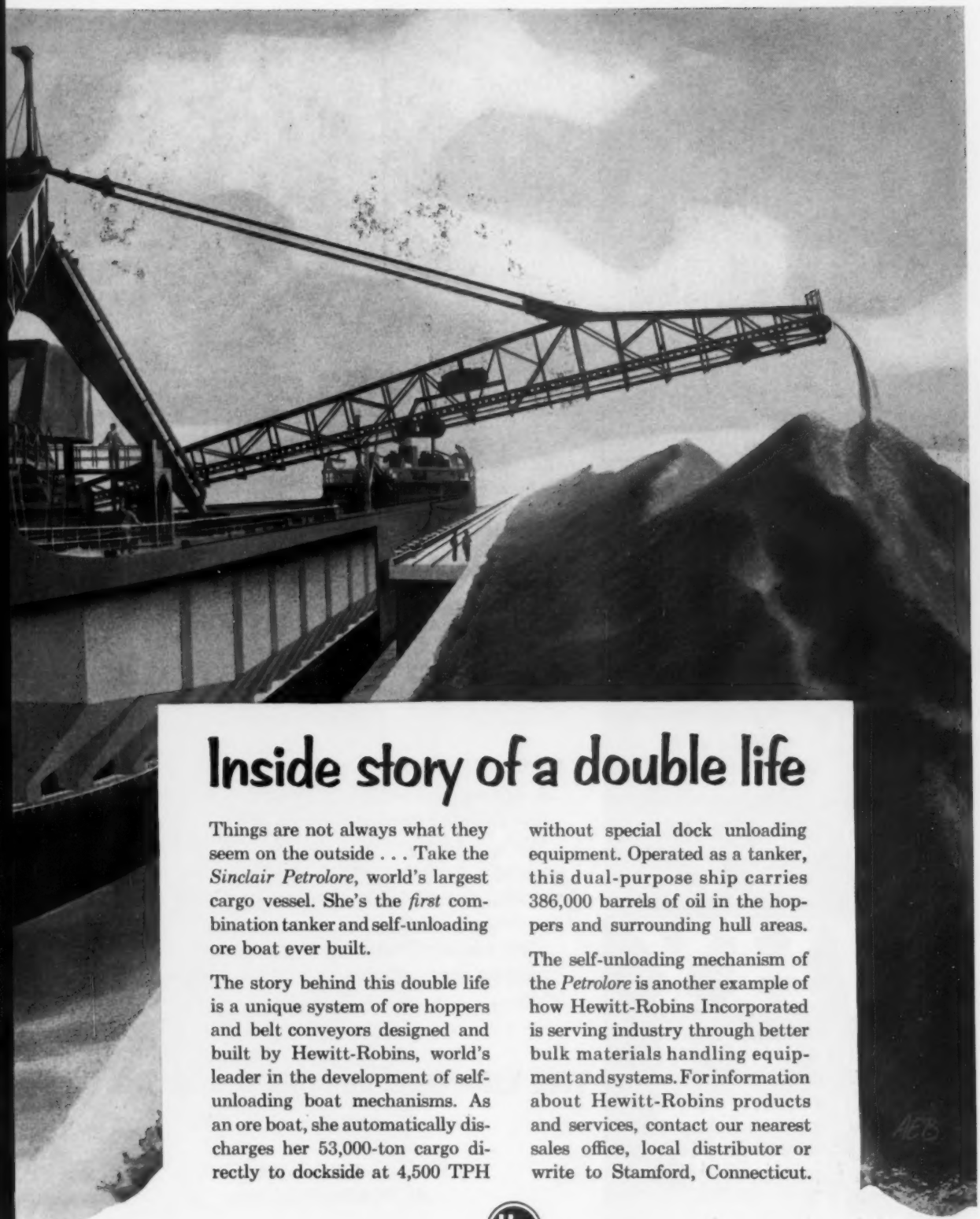
# . . . . think of Kaiser Chemicals

**Pioneers in Modern Basic Refractories**

CHEMICALS KAISER REFRACTORIES

Refractory Brick, Ramming Materials, Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

CONVEYOR BELTING and MACHINERY • INDUSTRIAL HOSE • VIBRATING EQUIPMENT • DESIGN, MANUFACTURE,



# Inside story of a double life

Things are not always what they seem on the outside . . . Take the *Sinclair Petrolore*, world's largest cargo vessel. She's the *first* combination tanker and self-unloading ore boat ever built.

The story behind this double life is a unique system of ore hoppers and belt conveyors designed and built by Hewitt-Robins, world's leader in the development of self-unloading boat mechanisms. As an ore boat, she automatically discharges her 53,000-ton cargo directly to dockside at 4,500 TPH without special dock unloading equipment. Operated as a tanker, this dual-purpose ship carries 386,000 barrels of oil in the hoppers and surrounding hull areas.

The self-unloading mechanism of the *Petrolore* is another example of how Hewitt-Robins Incorporated is serving industry through better bulk materials handling equipment and systems. For information about Hewitt-Robins products and services, contact our nearest sales office, local distributor or write to Stamford, Connecticut.

HR

**HEWITT-ROBINS**

**ENGINEERING and ERECTION of BULK MATERIALS HANDLING SYSTEMS • "GLIDE-RIDE" the NEW MOVING SIDEWALK**

When steel is 3 times stronger than cast iron . . .

Has two and one-half times the rigidity...

Yet costs a third as much per pound . . .

**WHY aren't more of your products designed for welded steel**

**Square Shear bed is more accurate** *because it's more rigid. By using welded steel box-type construction, deflection under load is cut 60% over conventional cast iron design. Cost of construction is 28% lower than if made from castings. Photo courtesy Famco Machine Company, Kenosha, Wisconsin. View is from underside to show design details.*

## HOW TO DESIGN HIGHER ACCURACY

### . . . in precision machinery

THE photo shows how key components for modern machine tools are made even more accurate while reducing costs of manufacture.

With steel designs less material is needed, because of steel's greater strength, high rigidity. Using welding, the steel materials can be placed where they do the most good.

Have Lincoln Electric show you how you can incorporate these advantages in your designs now. Write . . .

**THE LINCOLN ELECTRIC COMPANY**

Dept. 1519, Cleveland 17, Ohio

*The World's Largest Manufacturer of Arc Welding Equipment*

# Unsurpassed-anywhere!

IT ALL COMES DOWN to one fact... that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

**ROEBLING**

*Subsidiary of The Colorado Fuel and Iron Corporation*

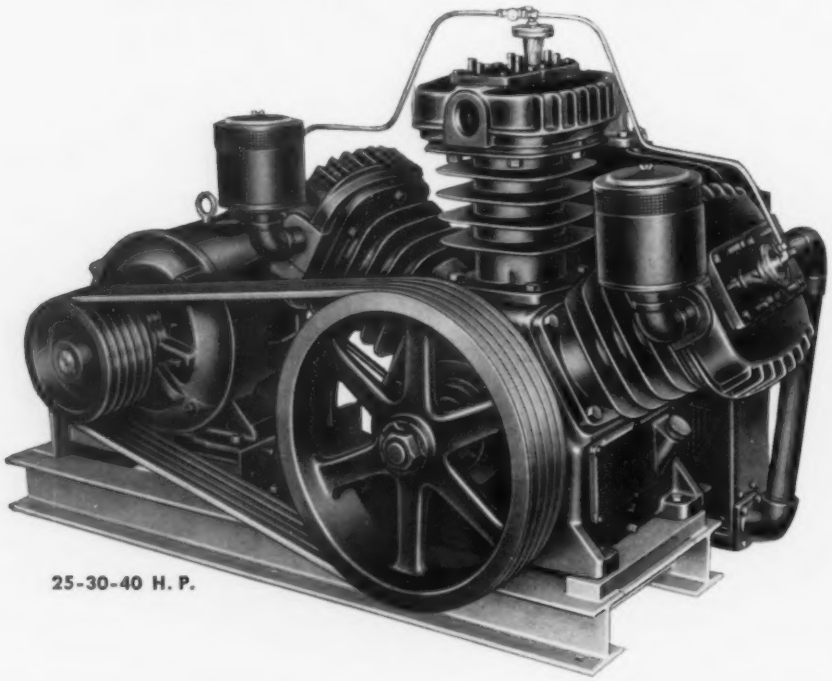


California giant Sequoias—largest of all trees.

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK

THE NEW CURTIS MODEL C-100
TWO-STAGE, AIR-COOLED AIR COMPRESSOR

# Provides Higher Operating Efficiency
# Costs Less to Install



25-30-40 H. P.

**THIS NEW** Curtis Two-Stage will deliver more air per minute, per horsepower and per kilowatt hour of electrical energy consumed, thus assuring a saving in your electrical bill.

It's Air Cooled, thereby eliminating expensive water bills and assuring quick and easy installation with no complicated plumbing problems.

The new C-100 embodies all the well-known Curtis engineering features such as centro-ring oiling and Timken Main Bearings.

*For complete information write for illustrated folder.*

Remember, you can count on... OUR 102nd YEAR

Curtis

MANUFACTURING COMPANY • PNEUMATIC DIVISION

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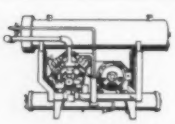
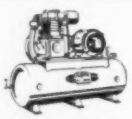
AIR HOISTS
AIR CYLINDERS



PACKAGED LIQUID
CHILLERS

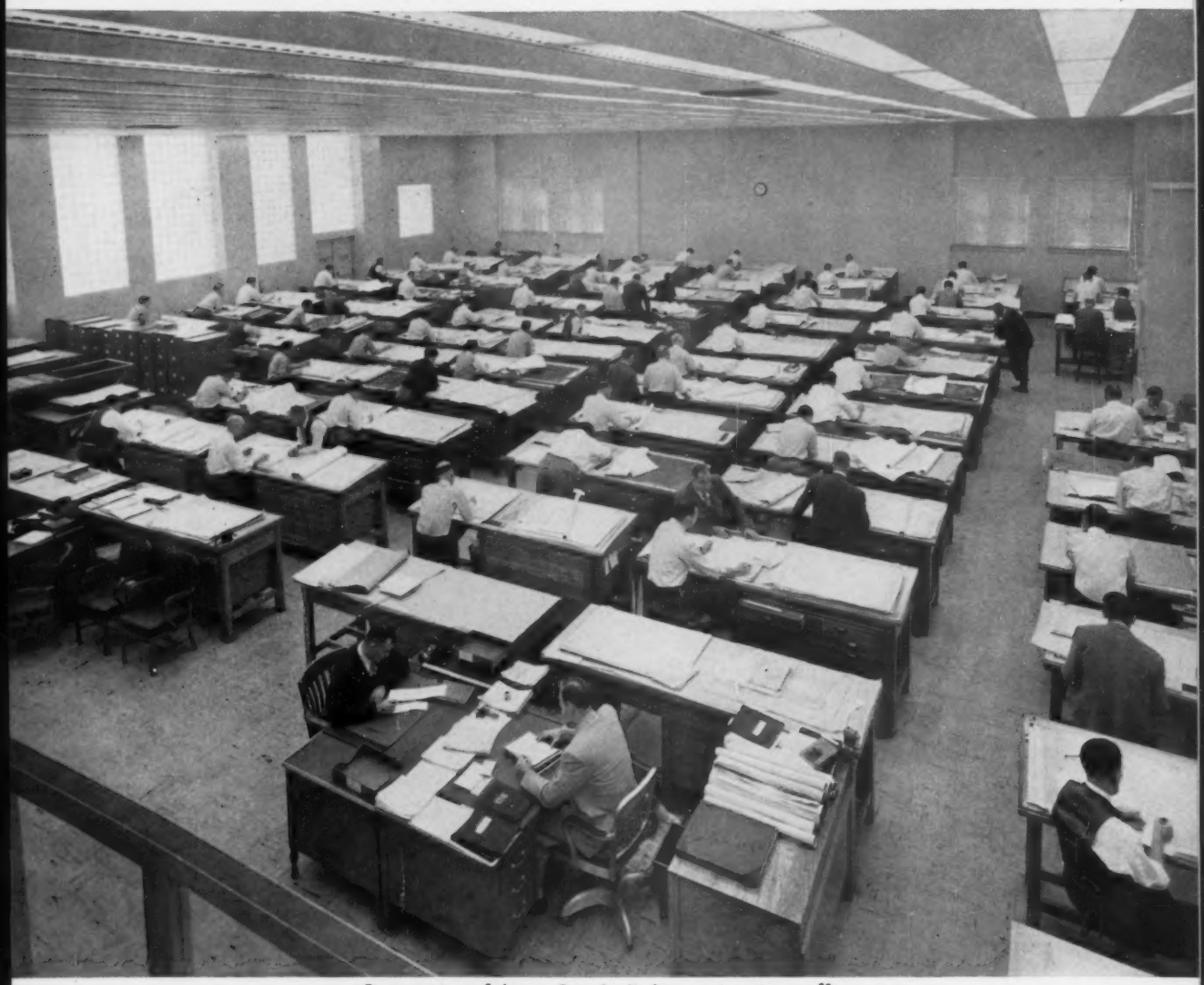


AUTOMOTIVE
AIR COMPRESSORS

AUTO LIFTS

PACKAGED
AND
REMOTE
AIR
CONDITIONING

54 YEARS OF DESIGNING AND BUILDING EQUIPMENT



One section of Aetna-Standard's big engineering staff

# men at work for ONE PURPOSE

To develop better equipment and more efficient equipment for production of steel, copper, brass, aluminum, in the form of higher quality pipe and tubing, tin plate, galvanized sheet and strip, cold drawn bars and tubes and many other products.

These engineering **idea men** have one purpose — to transform ideas into equipment as exemplified by the Rotary Hot Saw, the Tube Expander, the 5-Draw Drawbench and many ideas of Continuous Galvanizing, Continuous Electrolytic Tinning and Finishing Equipment.

They do not work alone. Many of the ideas for new equipment originate with you, the customer. The Aetna engineering idea staff refines and develops the idea into equipment. This ability to work with customers is one of Aetna's best assets. . . . That's why Aetna-Standard always has been known as **the idea people.**

# AETNA • STANDARD

**THE AETNA-STANDARD ENGINEERING COMPANY**

GENERAL OFFICES: PITTSBURGH, PA. PLANTS: ELLWOOD CITY, PA., WARREN, OHIO

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

# big industry, small world

annealing covers
billet reheating furnaces, continuous
carbon restoration and annealing furnaces, continuous
controlled atmosphere generators
high-speed stress relieving furnaces
one-way fired soaking pits
pit-type annealing furnaces
slab and billet heaters, continuous
strip annealing furnaces, continuous
strip galvanizing lines, continuous
wire patenting furnaces, continuous

Wherever this steel goes – from first soak to final shipping dock – it will find that the big steel industry is a small world as far as 'Surface' equipment is concerned. Somewhere along the line, whatever its destined shape, the steel will be made more workable and more useful in 'Surface' furnaces.

Why is it so easy to bump into 'Surface' in steel mills? One reason is that 'Surface' has literally grown up with the steel industry. A better reason is the confidence that steelmakers have in the performance of furnaces and generators manufactured by Surface Combustion Corp., Toledo 1, Ohio.

**Surface**
STEEL MILL FURNACES

Foreign associate companies:
British Furnaces, Ltd., Chesterfield; Stein & Atkinson, Ltd., London
Stein & Roubaix, Paris, Leige, and Genoa; Chugai Ro Kogyo Kaisha, Ltd., Osaka
Benno Schilde Maschinenbau, A.G., Bad Hersfeld (Hessen, Germany)

*The hoist with*

# EXPRESS TRAIN BRAKES

*It's* **Lodestar**® *of course!*

**NOW...FOR POSITIVE SAFETY...** *this new small electric hoist has* **ultra-modern dual braking** *...just like today's streamliner.*

1. **Like a train on a steep grade—AUTOMATIC REGENERATIVE ELECTRIC BRAKING safely sustains the descending load.**
2. **For stopping—the MECHANICAL FRICTION BRAKE safely locks the load. Any power interruption—intentional or accidental—automatically sets the mechanical brake to hold the load securely.**

**No other small electric hoist offers this dual electro-mechanical system—THE SAFEST BRAKING AVAILABLE.** ✳

✳ Lodestar ***really*** meets the requirements of the National and all State Safety Codes.

● **CALL YOUR CM DISTRIBUTOR TODAY**
for catalog, prices or immediate delivery of the *safer* Lodestar.

**CAPACITIES**
from ⅛ to 1 ton.
Single and 3 phase.

**Priced at**
**$149.50**
**AND UP**
**F.O.B. Factory**

CM HOISTS AND CHAIN

**CHISHOLM-MOORE HOIST DIVISION**
**Columbus McKinnon Chain Corporation**
Tonawanda, New York
DISTRICT OFFICES: NEW YORK • CHICAGO • CLEVELAND
*In Canada:* McKinnon Columbus Chain Ltd., St. Catharines, Ont.

# DESIGNING WITH ALUMINUM

**NO. 19**

This is one of a series of information sheets which discuss the properties of aluminum and its alloys with relation to design. Extra or missing copies of the series will be supplied on request. Address: Advertising Department, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California.

## PRE-ANODIZING TREATMENTS FOR ALUMINUM

One of the many surface treatments being used for aluminum products is the controlled formation of a relatively thin but durable oxide film. Films of this type are called anodic films and their qualities may be varied according to the particular end use of the product being manufactured. Because they are stable in many natural and man-made environments, they offer excellent resistance to corrosion. Through a variety of processes, it is possible to make anodic coatings that offer attractive decorative finishes, that resist abrasion or that act as electrical insulation. Certain anodic finishes are being dyed to create some of the most brilliant colors available in metal products.

Anodic coatings are fairly simple to apply. The process consists of passing an electric current between the metal and an acid solution in which the metal is immersed. However, surface contaminants that are unavoidable during fabrication will affect the coating adversely if they are not removed before anodizing. Oil and metal contaminants picked up by the aluminum surface will cause darkening or streaking of the anodic film and may even inhibit its formation. Therefore simple pre-anodizing treatments are of great importance in obtaining a uniform, continuous anodic film. The choice of the optimum treatment depends upon the ultimate purpose of the anodic coating.

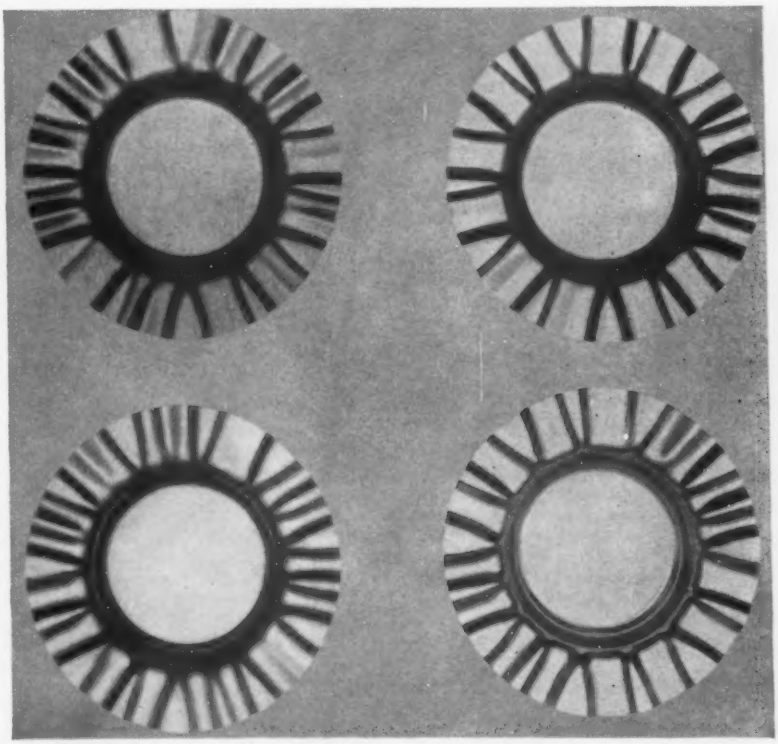
If heavy soil or grease are present, their removal by vapor degreasing or an inhibited alkaline cleaner should be the first step in any pre-anodizing treatment. Both of these cleaning methods are relatively inexpensive, require little handling and may be used to clean inaccessible surfaces thoroughly.

Vapor degreasing may be done by either a batch method or as part of a continuous processing line. The metal to be cleaned is passed vertically through a vaporized solvent such as trichlorethylene or perchlorethylene. In less than a minute the vapor, which condenses on the cool metal and runs off, effectively removes normal soil. When the oily or greasy contamination is extremely heavy, the metal may be wiped with a solvent before entering the vapor degreaser.

Inhibited alkaline cleaners, 4 to 8 oz. per gallon of water, are generally operated at 160F to 180F. The metal to be cleaned may be sprayed or immersed in the solution for two to five minutes, after which it is rinsed in water. When cleaning parts that have small crevices, a quick dip in dilute nitric acid may be necessary as an additional rinse to remove residues from the cleaning solution. These parts are then water rinsed again before proceeding to the next finishing treatment.

### For General Use

A caustic etch is one of the more common treatments used for preparing aluminum surfaces for anodizing. A typical bath would contain five per cent caustic soda. Numerous proprietary compounds of this type are available. The metal to be etched is immersed in this bath, which is usually maintained at 160F, for a period of two to five minutes. A lustrous, satiny finish can be obtained by caustic etching certain alloys, and the depth of the etch can be controlled by varying temperature, time or concentration of caustic. Variations in either the etching conditions or in the etchants may also be used for creating different shades, or degrees of total reflectivity. Sodium fluoride is frequently added to caustic etch solutions to obtain a desired effect. This addition imparts a finer, more uniform etch to the aluminum surface.



TOP: Anodized and dyed ashtrays. BOTTOM: Anodized natural color ashtrays. Normal good pre-anodizing treatment was used on ashtrays at left; normal good pre-anodizing treatment, plus Kaiser Aluminum bright dip, used on ashtrays at right.

Still finer etching can be obtained by using an acid fluoride bath which produces a white surface that has high total reflectivity. A solution of this type,

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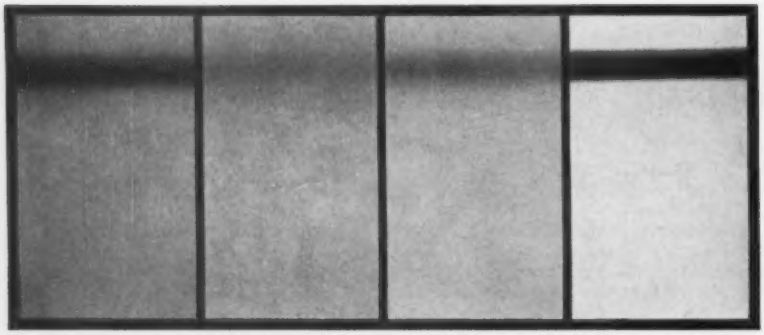


Alloy 5357 sheet anodized after various pretreatments. Note differences in specular reflectivity shown by black bar mirrored on surfaces.

which is used in finishing diffuse light reflectors, is made of a mixture of sulfuric and hydrofluoric acids.

## For Minimum Loss of Metal

To clean aluminum with a minimum loss of metal prior to anodizing, a chromic-sulfuric acid mixture is used. This mixture effectively removes oil stain, oxide and heavy metal inclusions. However, it attacks the aluminum only slowly. Consequently, the anodized surface may not appear as uniform as a surface prepared with a caustic or acid etch treatment. A typical mixture of this type would contain 3.5% by weight chromic acid (anhydride) and 17.5% by weight of concentrated sulfuric acid (specific gravity 1.84). The bath is operated at 180F, and the aluminum is immersed in it for about five minutes. As in the case of caustic or acid etching, the operation can be controlled by changing any of the variables in the process.

## For Decorative Purposes

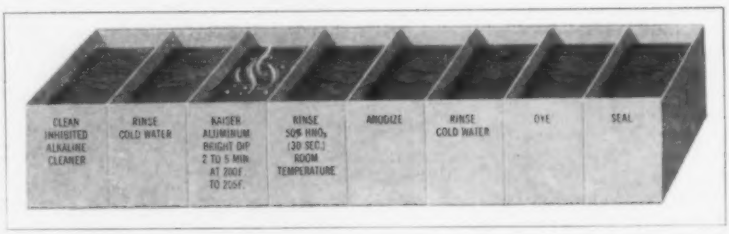
One of the chief purposes of anodizing aluminum is to provide a clear, highly reflective coating for decorative applications. The appearance of giftware, electrical appliances, automobiles, and many other products is being enhanced with brightly anodized aluminum trim of a functional or purely decorative nature. In many products, dyes are being used to add color to this metallic sparkle.

To create this attractive anodized finish the brightening process which precedes anodizing must have a uniform action across the entire surface of the metal. Several types of brightening processes are available. An electrochemical process, requiring the passage of an electric current between the metal and a special acid or alkaline bath in which it is immersed, is used on such highly polished items as light beam reflectors. Concentrated acid baths requiring no electricity during immersion may be used for cleaning and brightening a great many aluminum alloys. Unfortunately, these processes are somewhat expensive and the fumes given off during operation can create a hazard to workmen.

Dilute acid solutions are generally easier to handle and are quite effective on most alloys. Furthermore, dilute acid baths are considerably less expensive to prepare and maintain. Kaiser Aluminum Bright Dip, introduced a few years ago, is a dilute acid brightener which is being used by many anodizers of aluminum end products that depend on a pleasing appearance to increase their sales appeal.

Normal dipping time for Kaiser Aluminum Bright Dip is two to five minutes, and the bath is maintained at 200F to 205F. A flow sheet for using this Bright Dip in finishing an aluminum item which was to be color-anodized would include these steps:

1. Clean
   Inhibited alkaline cleaner
2. Rinse in cold water
3. Kaiser Aluminum Bright Dip
   2 to 5 minutes at 200F to 205F
4. 50% $HNO_3$ rinse (30 sec.)
   room temperature
5. Rinse in cold water
6. Anodize
7. Rinse in cold water
8. Dye
9. Seal




For other applications, such as in the architectural field, specialized anodizing techniques may be required. Techniques of this sort are the subject of continuous study by Kaiser Aluminum's Department of Metallurgical Research. Further information concerning pre-anodizing treatments may be obtained by contacting the Kaiser Aluminum sales office listed in your telephone directory, or one of our many distributors. Kaiser Aluminum and Chemical Sales, Inc., *General Sales Office*, Palmolive Bldg., 919 North Michigan Avenue, Chicago 11, Illinois; *Executive Office*, 7775 Kaiser Bldg., Oakland 12, California.

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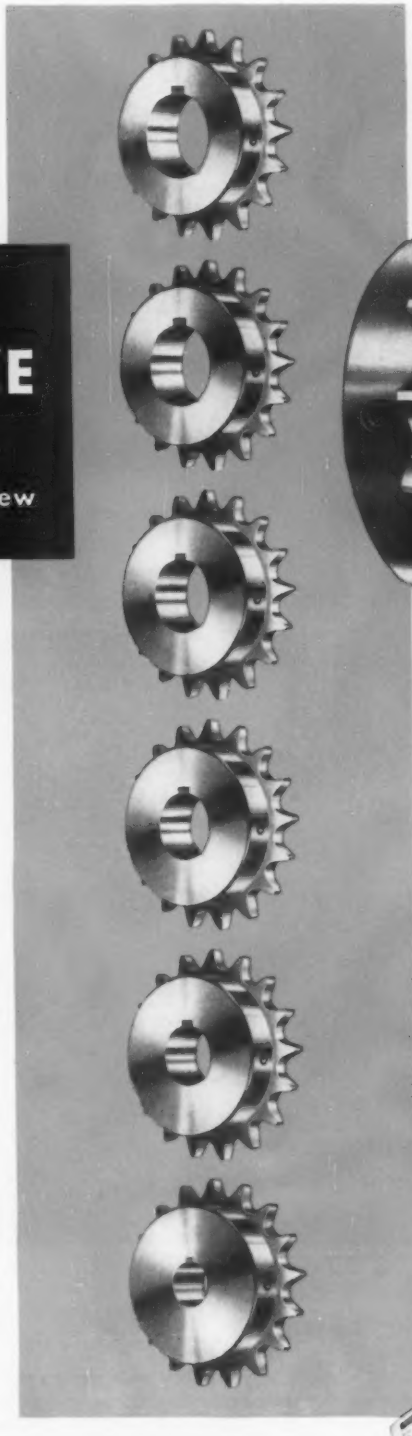

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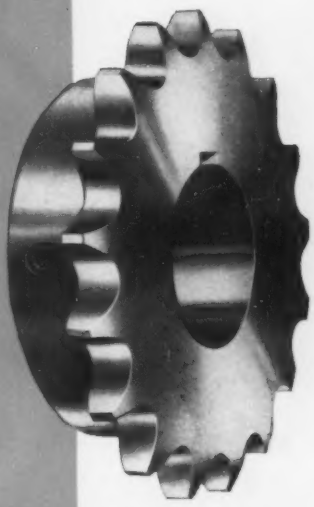

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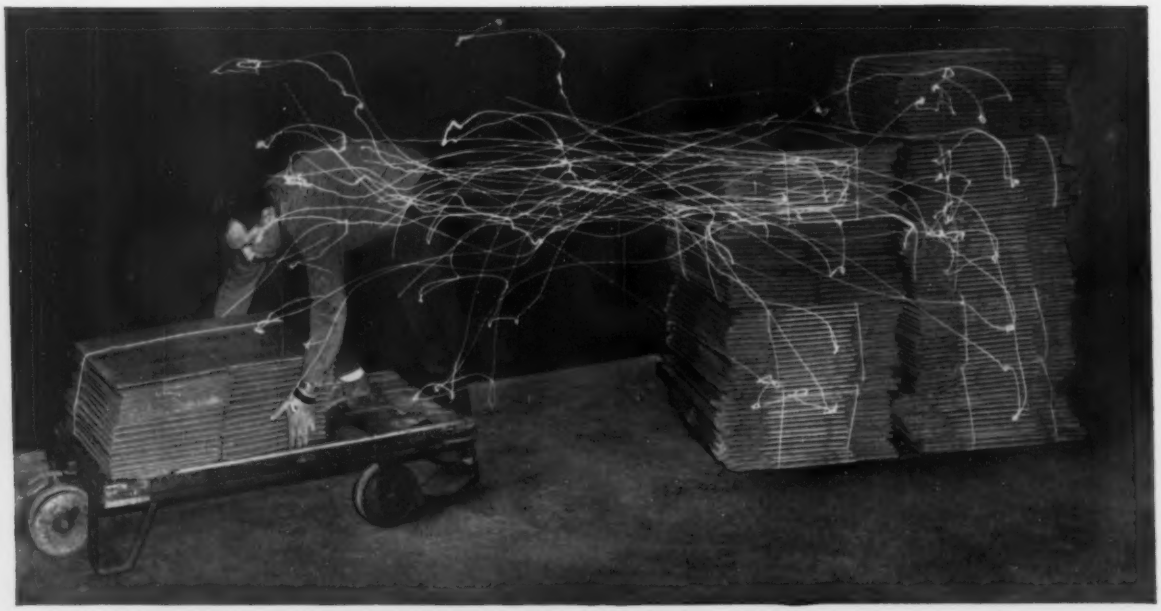

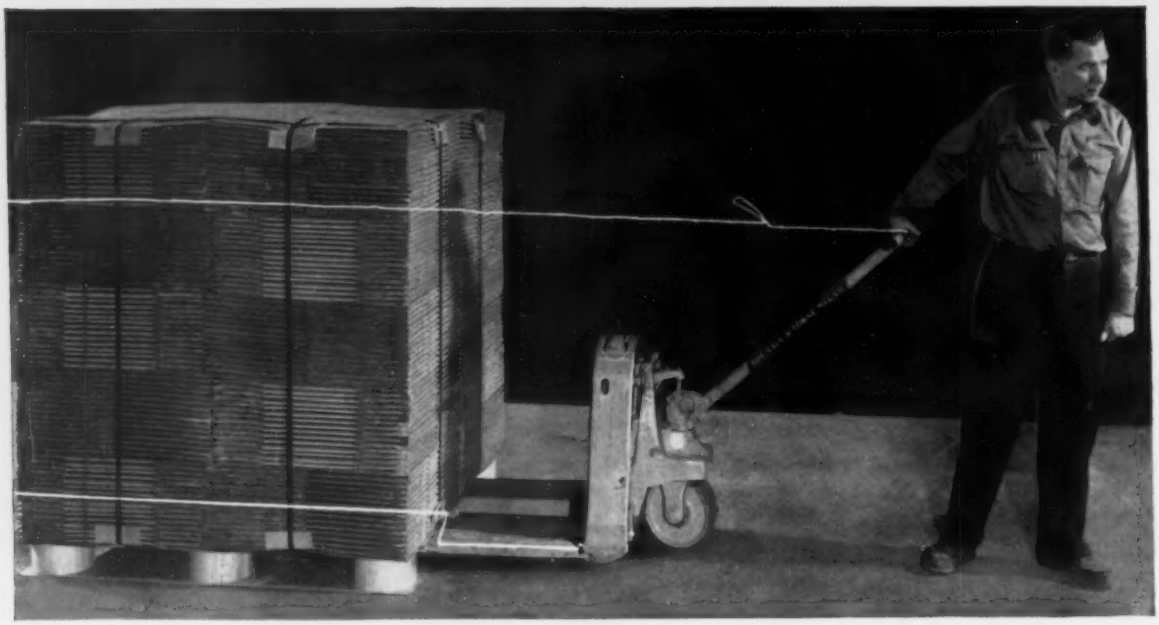

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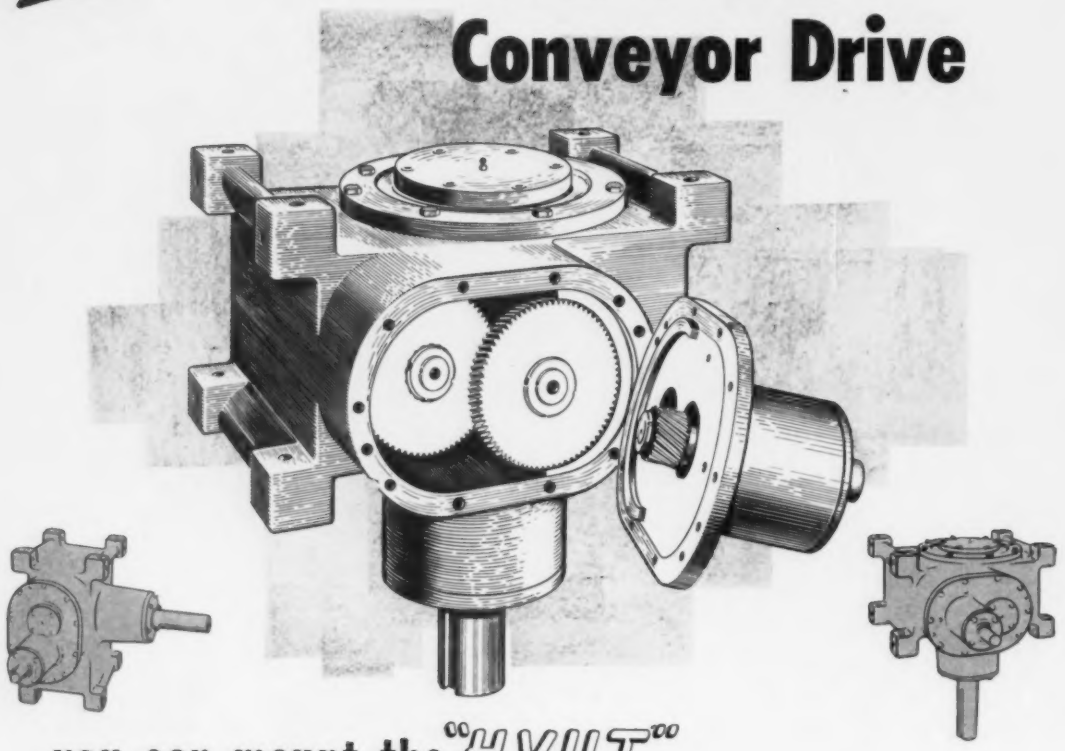
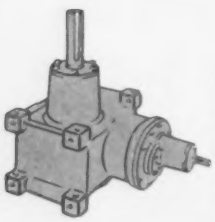
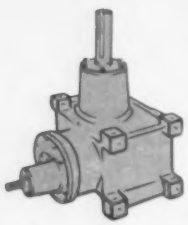
# Conveyor Drive

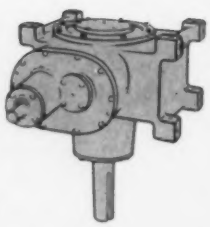


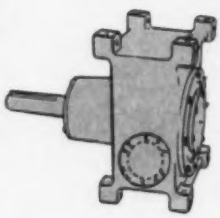
## you can mount the "*HVUT*"

## in any of these positions









The Phillie Gear "HVUT" Speed Reducer was developed from many years' experience, especially for application to *Conveyor Drives*. It embodies all features for *Flexible Mounting*, plus wide range of output speeds, and the rugged durability so necessary for conveyor installations—yet all at a low initial cost.

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The "HVUT" Unit may be mounted in any of the positions shown above, and when the shaft is mounted in a vertical down position, it is ideal for the overhead conveyors, which are so widely used in the automotive industry; also, the dust-proof housing makes it very desirable for pit type conveyors. When the output shaft is mounted in a vertical up position, the "HVUT" Reducer is excellent for Tow line Conveyors.

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Gearing, bearings, and housing of the "HVUT" Unit is manufactured in strict accordance with AGMA Standards... Standard reduction ratios from 50:1 to 1800:1 in six unit sizes can normally be delivered promptly from stock.

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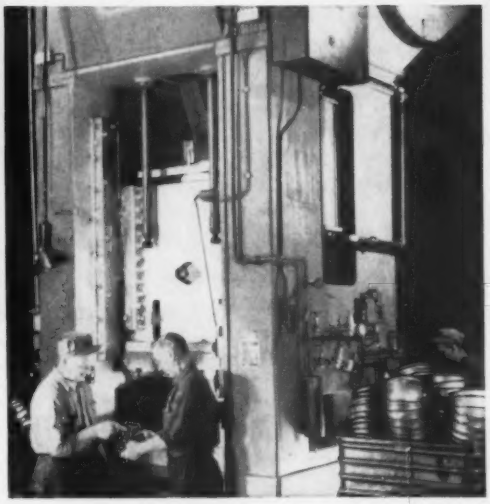

**CONSTRUCTION** men come to Barium for specials, too. Here at Erie Bolt and Nut Co. bolts, nuts, studs and machine parts—in quantities as small as a hundred units—are turned out to precise tolerances in a variety of alloy and standard steels. For facts on Barium's part in your industry's growth, write Barium Steel Corporation, 25 Broad Street, New York 4, N. Y.

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6.2A

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Take a tip from the Bedford Foundry & Machine Company of Bedford, Indiana, manufacturers of Bedford Cranes and the twenty-ton mill type bucket crane pictured here. Give your profits a lift with ACIPCO centrifugally spun steel tubes.

*Photo courtesy of the Bedford Foundry & Machine Company, Bedford, Indiana.*

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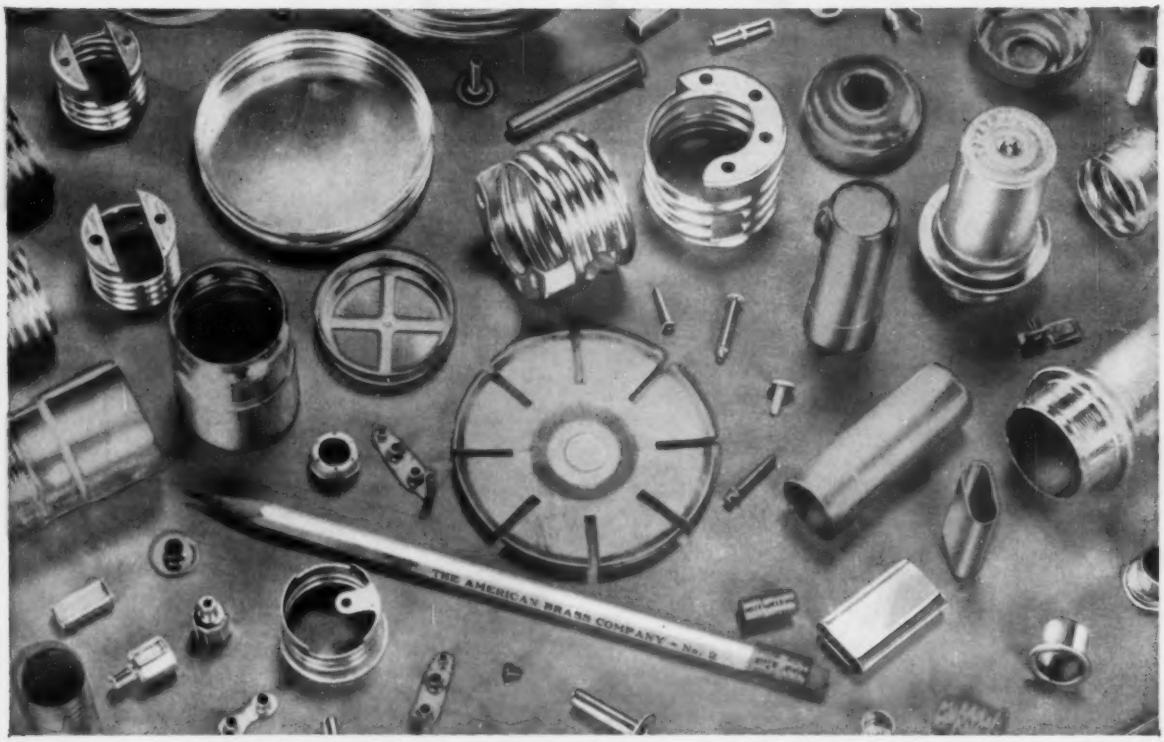


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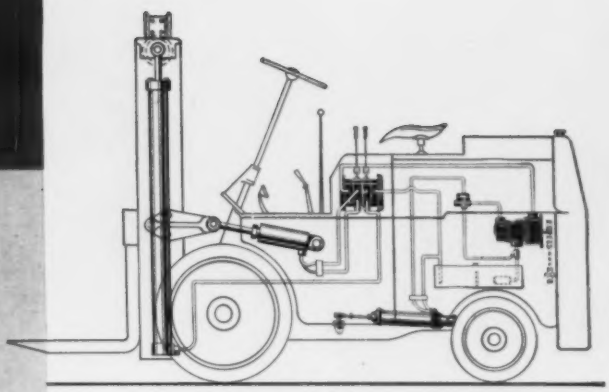
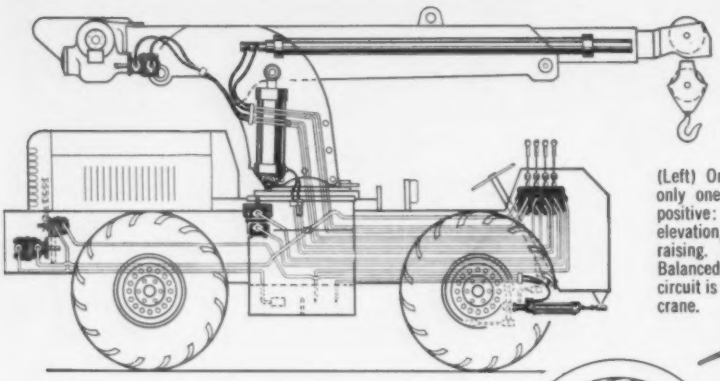
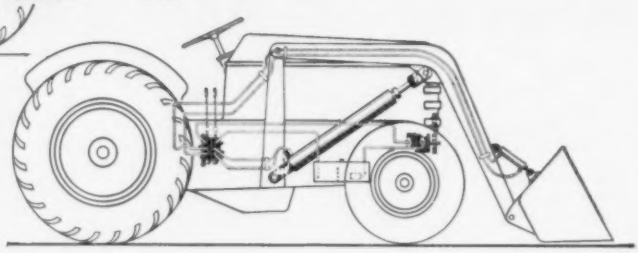


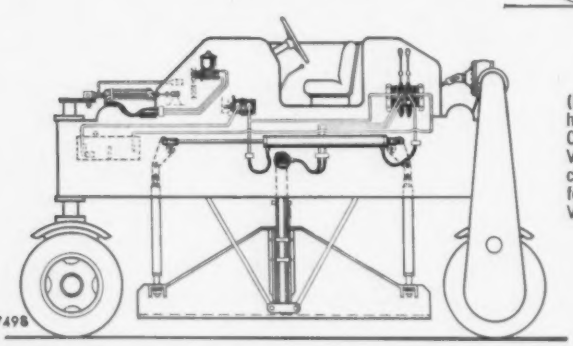
(Above) Fast tilting and lifting are possible along with exclusive "feathering" ability. Also, fingertip power steering permits operator to maneuver vehicle with one hand and control loading operations with the other. Additional vehicle attachments can be hydraulically controlled by simply adding sections to existing control valve eliminating necessity of mounting separate valves.



(Left) One Vickers Hydraulic System (using only one pump) provides fast, smooth and positive: (1) turntable rotation, (2) boom elevation, (3) boom extension, and (4) load raising. Turntable is driven by a Vickers Balanced Vane Type Fluid Motor. Another circuit is used for power steering this hydraulic crane.



(Right) Fast, easy and dependable operation of front end loader depends upon Vickers Balanced Vane Pump and Vickers Two-Section Directional Control Valve. Automatic wear compensation is inherent in all Vickers Balanced Vane Type Pumps. Note simplicity of installation.




(Left) Straddle carrier uses hydraulic power to handle the load with precision and speed. Compact, two-section Vickers Multiple Unit Valve has double-acting valve for opening and closing load hooks and single-acting section for raising load. Separate circuit provides Vickers Hydraulic Power Steering.

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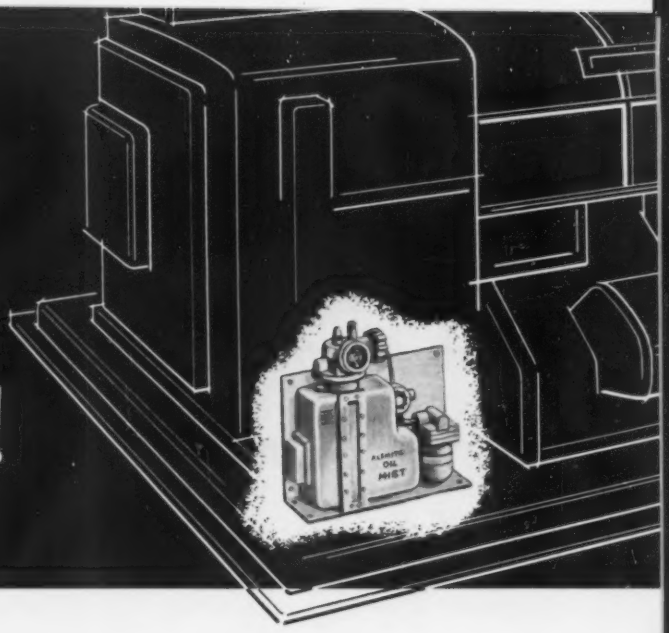
*ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921*

# save up to 90% on lubricating costs!




# ALEMITE OIL-MIST AUTOMATIC LUBRICATION

**multiplies bearing life...cuts product spoilage ...boosts machine output in almost every industry!**

Alemite Oil-Mist Automatic Lubrication brings remarkable savings . . . in lubricants, man-hours, bearing life, and decreased product spoilage.

Alemite Oil-Mist *atomizes* oil into mist—distributes it through tubing to bearings—bathes all bearing surfaces with a cool film of clean oil. Maintains uniform oil film on plain and anti-friction bearings, gears and chains—despite variations in load, temperature or speed. Amazingly simple, continuous and fully automatic . . . Alemite Oil-Mist eliminates the waste and uncertainties of the "human element" in lubrication.

Let us show you how Alemite Oil-Mist provides more efficient, foolproof lubrication, at lower cost! Mail coupon below for a graphic demonstration!

## 8 ADVANTAGES of the ALEMITE OIL-MIST System

1. **Continuous Lubrication**—Constantly deposits fresh, clean film of oil on all surfaces of all bearings in the system.
2. **Fully Automatic Lubrication**—Can start and stop with operation of machine switch.
3. **Elimination of Guesswork**—No bearing can be over-looked, nor over-lubricated! Every bearing picks up only as much Oil-Mist as it needs.
4. **Reduction of Bearing Temperatures**—Acts as bearing coolant, can lower bearing temperatures as much as 20° F.
5. **Reduction of Types of Oil**—Reduces number of oils that must be stocked, handled, and applied.
6. **Elimination of Downtime**—All bearings in the system are constantly lubricated while machines continue to operate.
7. **Extension of Bearing Life**—Multiplies bearing life many times. Life of grinding machine bearings has been extended from 400 to 7,000 hours!
8. **As High As 90% Less Oil Consumption**—Alemite Oil-Mist usually consumes about 1/10 the amount consumed by any other oiling method!

**Alemite Oil-Mist Lubricates ALL Types of Mechanisms**

Anti-friction Bearings | Plain Bearings | Chain | Gear | Gear Cases

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**ALEMITE**

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**A Product of STEWART-WARNER CORPORATION**

**Alemite Division of Stewart-Warner, Dept. N-56**
**1850 Diversey Parkway, Chicago 14, Illinois**

☐ Please send me a FREE copy of your new and complete Oil-Mist catalog.

☐ Please have your Alemite Lubrication Representative arrange a no-obligation demonstration.

My Name .....

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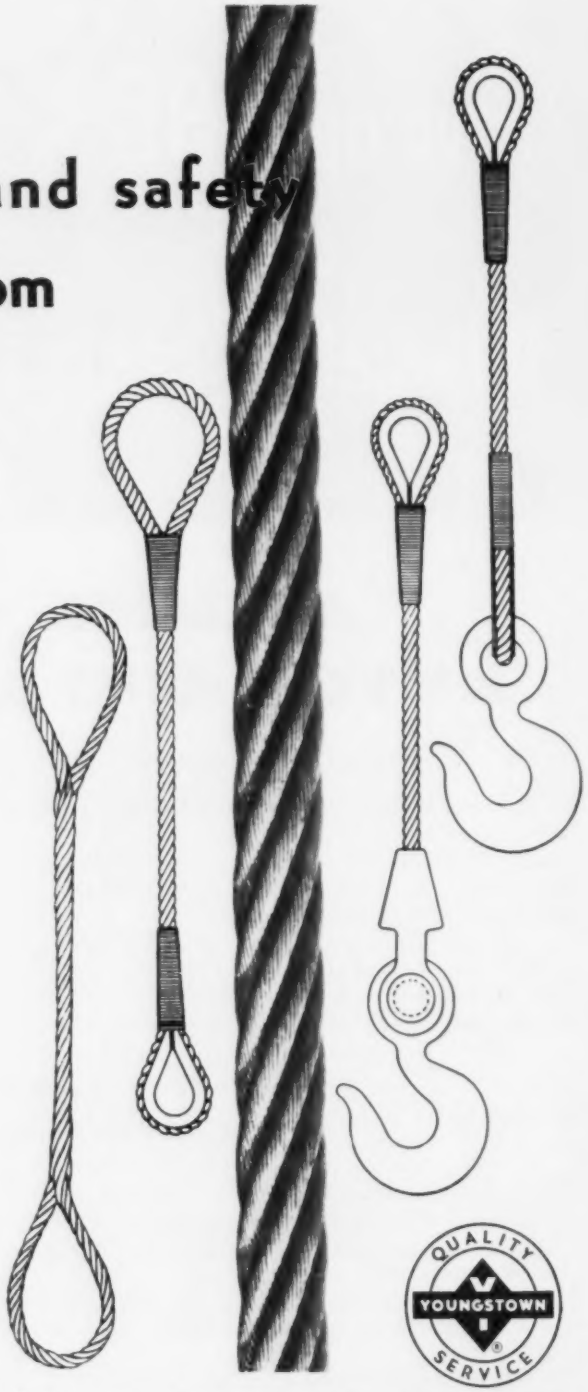
# Where strength and safety count, rope wire from Youngstown does the job!



Long experience in the manufacture of wire rope and rope fittings has taught Upson-Walton all the ins-and-outs of this business. Theirs are quality products, long noted for strength and safety. And, these qualities of strength and safety become inherent in Upson-Walton products with the selection of the basic material: Youngstown Yolectro Rope Wire.

For, Youngstown offers the most vital requirement of wire for wire rope—that of uniformity. Controlled and painstaking steel processing are the reasons why; extra strong and flexible rope wire, easy to form and yet tough enough to meet the approval of the most critical rope manufacturers and users is the result.

Youngstown Bright and Galvanized Yolectro High Carbon Rope Wire is furnished in all AISI grade designations. Phone or write our nearest District Sales Office.

QUALITY YOUNGSTOWN SERVICE

**Youngstown** YOLECTRO HIGH CARBON ROPE WIRE

**THE YOUNGSTOWN SHEET AND TUBE COMPANY** *Manufacturers of Carbon, Alloy and Yoloy Steel*

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SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

# K&R Two-Plane Straightener

## gives 2-machine performance in one operation

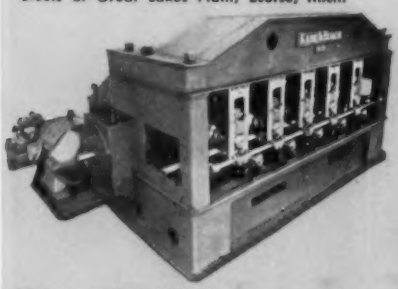
N-A-X

NATIONAL STEEL CORPORATION

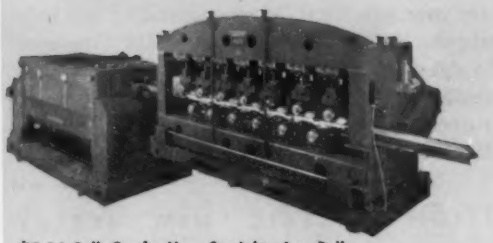
Straightening Spring and N-A-X Tensile Steels at Great Lakes Plant, Ecorse, Mich.

The K&R No. 2B-15 Roll Comb. Vert. and Hor. Straightening Roll, Type B, shown in use at the Great Lakes Steel Corporation, Detroit, Michigan, Division of National Steel Corporation, has continued to give satisfactory service since its installation in 1936. This Two-Plane straightener gives the flexibility of operation needed for edge and flat straightening of rectangles, squares, hexagons and other shapes. Flexibility that gives you the advantage of two-machine operation in one pass. *Illustrated are the modern K&R 2B Straightening Rolls, both Two Plane and Single Plane Types.*

Learn how K&R Machinery can cut costs and boost production in your plant. Our engineers will furnish recommendations, operating data, estimates—no cost, no obligation. Write or wire today.



2B-10 Roll Hor. Shaft Straightening Roll, Type B, shown at maximum longitudinal centers, above, and minimum longitudinal centers, below.



2B-24 Roll Comb. Hor. Straightening Roll, Type B.

2B-16 Roll Comb. Hor. and Vert. Straightening Roll, Type B.

Metal Working Machinery Since 1887

Cold Roll Forming Machines
Bending Rolls — Straightening Rolls
Slitting Lines — Flying Shears & Saws
Special Metalworking Equipment

**Kane & Roach**

INCORPORATED

SYRACUSE, NEW YORK • ESTABLISHED 1887

# This Heavy Duty Belt Cuts Cost in Tough Hauls!

Ray-Man Conveyor Belt is engineered to stand up where ordinary belts tear, puncture, or experience fastener pull out. Elastic cushioned strength member plies made from strong, natural and synthetic fabric give this belt resilience to the impact of shock loading flexibility to trough easily and train naturally. Compensated, balanced construction relieves outer ply stress, prolongs belt life. Ray-Man requires no breaker strip and offers exceptional fastener holding ability under extreme conditions of use. Ray-Man Conveyor Belt cuts handling costs because it does a better job . . . and *it lasts longer.*

Like all Manhattan heavy duty conveyor belts, Ray-Man is mildew-proof and moisture resistant. R/M's exclusive "XDC" Cover protects the belt against wear, tear, cuts and abrasion to a degree never before attained.

For unusually abusive shock loading, R/M's extra-cushioned Homocord Conveyor Belt may be better suited for your job. An R/M representative will help you compare the advantages of all R/M Conveyor Belts to determine the one that will cut your handling costs most . . . give you "More Use per Dollar" in your operations. Contact him today . . . or write for Bulletin 6906 and 6915.

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

## RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

# Our challenge stands

## ...anything that can be made of steel sheets can be made of

Now we are not suggesting you fabricate a violin out of Wheeling SOFTITE. But it is reassuring to know that *if you wanted to,* here is one sheet that can take every bend, every fold, every intricate turn without peeling or flaking.

Incredible? Amazing? That's Wheeling SOFTITE... the tightest coated sheet yet produced. So tight-coated, in fact, you can use it to make *anything* you can make out of steel sheets.

Yes, SOFTITE, made by the same company that developed Cop-R-Loy, the original copper-bearing steel pipe...and DUCTILLITE, the original cold reduced tin plate. Now SOFTITE, the ultimate in ductile, tight-coated galvanized steel, a product of Wheeling Steel Corporation, Wheeling, West Virginia.

**WHEELING**

**SOFTITE®**

**GALVANIZED SHEETS**

# IT'S WHEELING STEEL

**District Sales Offices:** Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling.

# FIRST

## to inaugurate Employee Welfare in the Iron Ore Mining Industry

A special Welfare Department created in 1905 provides financial help in sickness, and death, and for medical treatment, for good housing at low rents and with excellent sanitary arrangements, for improving health conditions in the mines, and for increasing and extending educational opportunities for the employes and their families. A Pension System was instituted in 1909. The present-day towns on the iron ore ranges, with their alert and healthy citizens, churches, schools, community centers, clubs, summer and rest cottages, parks, etc., are eloquent testimonial of the success of the Cliffs Welfare Program.

LAKE SUPERIOR IRON ORE
VESSEL TRANSPORTATION
COAL • FERRO ALLOYS

THE Cleveland-Cliffs IRON COMPANY
UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

# "The right quench oil for our work is

# SHELL VOLUTA OIL 23"

says Garland Wilcox, Chief Metallurgist
Wallace Barnes Co., Bristol, Conn.

## ...the story of a profitable change

WALLACE BARNES COMPANY and steel springs have "gone together" for nearly a century. Most of today's output is in SAE 1075 or 1095 steel.

Because the quenching operation is so important to the life of springs, the Wallace Barnes laboratory decided to test its regular quenching oil against some of the newer products, including Shell Voluta Oil 23. This is what they found:

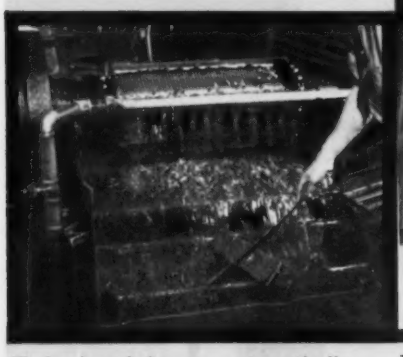
Shell Voluta Oil 23 showed a superior quench rate, with correct hardening and relative freedom from distortion. It drained more rapidly from the quenched parts, reducing dragout loss. It washed off more completely in the alkaline cleaner; it reduced flaming, and cut down on the oil baked to parts.

Wallace Barnes reports that this oil has almost eliminated trouble with "slack-quenched parts," and that heavier stock now goes through without special handling. So . . . Shell Voluta Oil 23 has replaced the former quench oil in all tanks of the spring hardening departments, serving salt pot lines and shaker hearth furnaces.

We'll be glad to provide full information on Shell Voluta Oil 23.

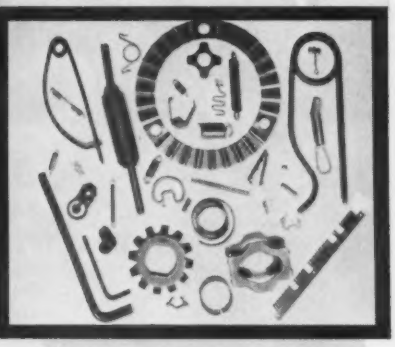
WALLACE BARNES CO.
A division of Associated Spring Corp.
Bristol, Conn.

*Photos courtesy "STEEL"*



Shaker hearth furnaces automatically dump parts into Shell Voluta Oil 23, then remove and drain them.

Flat springs at austenitizing temperature get a fast quench in Shell Voluta Oil 23.



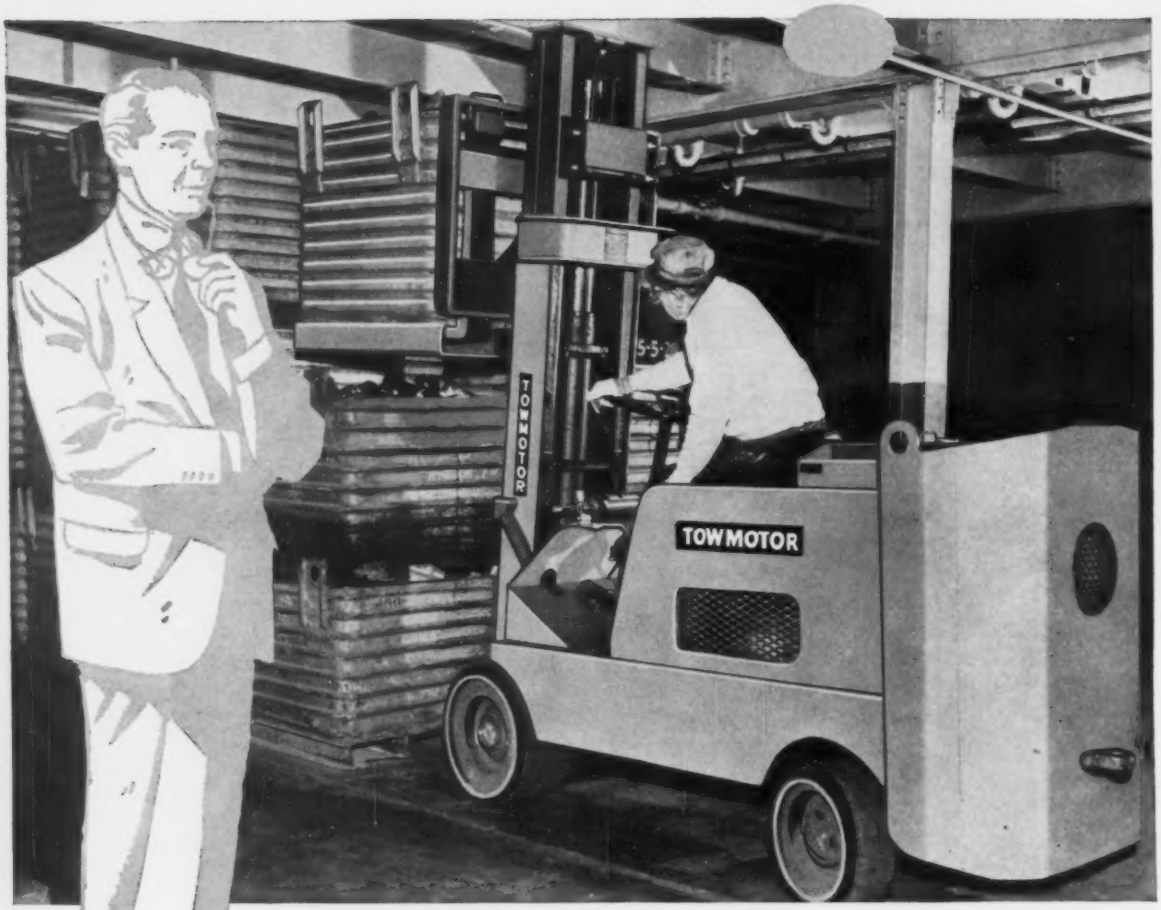
Over 35,000 prints of production items like these are kept on file at Wallace Barnes Co.

**SHELL OIL COMPANY**

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

# Am I ready for a Towmotor?




**You are, if** your present handling operation is not fully mechanized, and requires: **1.** *3 or more full-time workmen.* **2.** *Movement of heavy or bulky unit loads.*

In today's competitive market, you must step up your business operations with efficient handling methods. To discover how your firm can speed handling, eliminate "bottlenecks" in the flow of materials, and make maximum use of storage space, call your Towmotor representative today. He'll show you how to cut handling costs and open the door to greater profit. Write for certified Job Studies covering your industry. TOWMOTOR CORPORATION, Div. 1505, 1226 E. 152nd St., Cleveland 10, Ohio.

*America's* ***best engineered*** *fork lift truck*

**TOWMOTOR**
*THE ONE-MAN-GANG*

*Read how a company in the Metal Working Industry increased its storage capacity 200%. Ask for Job Study #95*

THERE'S ONLY ONE FORK LIFT TRUCK CALLED TOWMOTOR

See the TOWMOTOR EXHIBIT Cleveland Auditorium - June 5-8

# NOW...

## an EXTERNALLY WRENCHED SCREW

**that can be used in *standard***
**counterbored holes with *standard* wrenches**

**THE FERRY CAP**

# countr-bor®

**SCREW**

For counterbored or other socket head screw applications, external wrenching instead of internal wrenching means:

- **More gripping surface**
- **More torque**
- **More savings**

**TRY THEM—**

Save knuckles—save time—save costs.

Solve simply the tough assembly problems and improve appearance where socket screws are required.

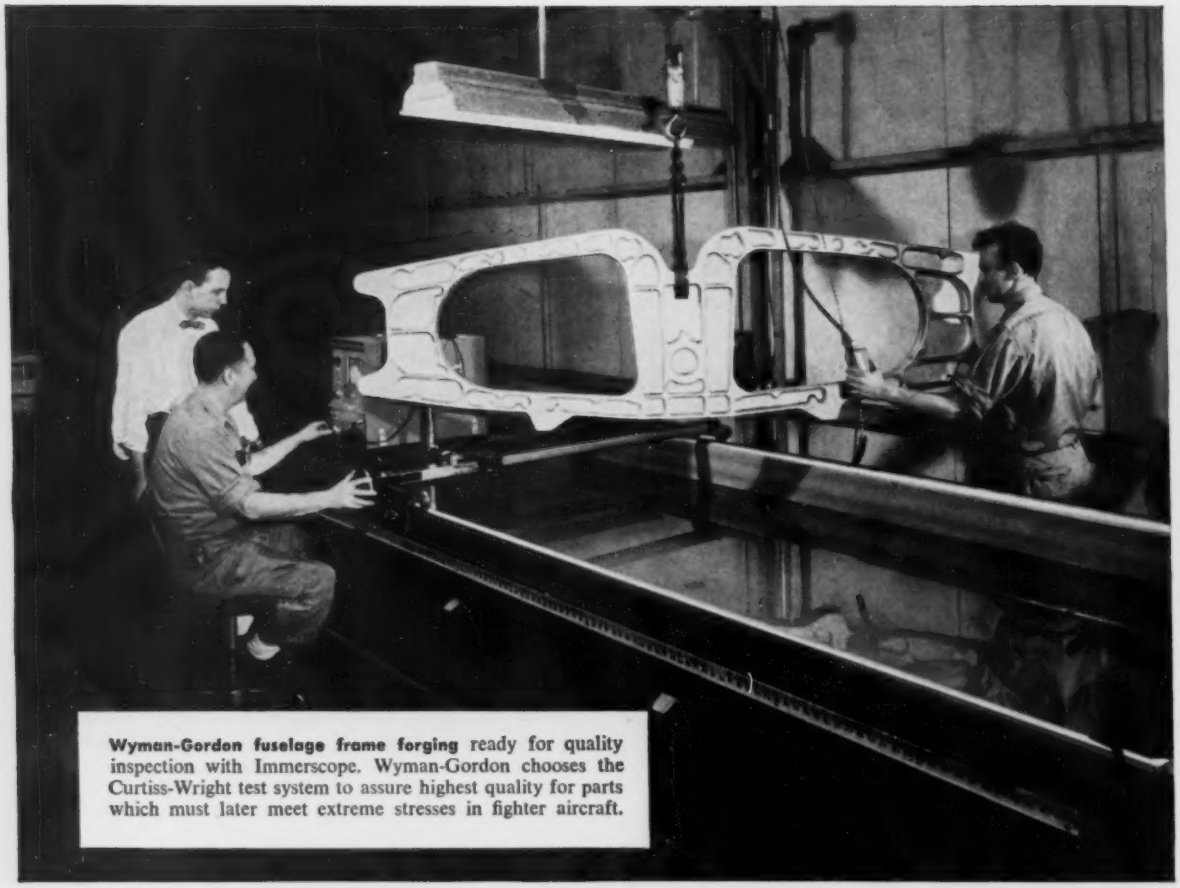
Send for samples.

You'll receive prices, complete information and samples promptly upon request.

***Any type socket wrench handle with standard 12-pt. socket is used for counterbored applications.***

**Ferry Cap Countr-Bor Screws**
**PATENT APPLIED FOR**
**MANUFACTURED SOLELY BY**

**THE FERRY CAP & SET SCREW COMPANY**
**2157 SCRANTON ROAD • CLEVELAND 13, OHIO**



**Wyman-Gordon fuselage frame forging** ready for quality inspection with Immerscope. Wyman-Gordon chooses the Curtiss-Wright test system to assure highest quality for parts which must later meet extreme stresses in fighter aircraft.

# CURTISS-WRIGHT IMMERSCOPE PROVES SOUNDNESS OF FORGINGS BEFORE SHIPMENT FOR WYMAN-GORDON

**New Curtiss-Wright Immerscope** (Model 424-A) protects quality of forgings, rolled plate, welded tubing, extrusions and other metal products. Complete with controls for gate width and depth, alarm trigger, and sensitivity time control. 400 w, 110-120 v, 60 cycle. 16"x15"x21½". Operates at 2.25, 5, 10, 15 and 25 megacycles.

### *Non-destructive, ultrasonic test equipment guards your reputation for quality*

An ultrasonic "search crystal" passed back and forth over a forging immersed in water "sees" through the metal, using electrical vibrations of up to several million cycles a second. Internal flaws are shown as "pips" — visible readings reported on the cathode ray of the precision Curtiss-Wright Immerscope. This ultrasonic detective sounds out variations from metal specifications . . . provides for thorough inspection before or after machining. Production is speeded, costs lowered. Customers receive quality controlled shipments every time.

Put ultrasonics to work for you. Write for full details and engineering assistance to Industrial and Scientific Products Division, Curtiss-Wright, P.O. Box 270, Caldwell, N.J.

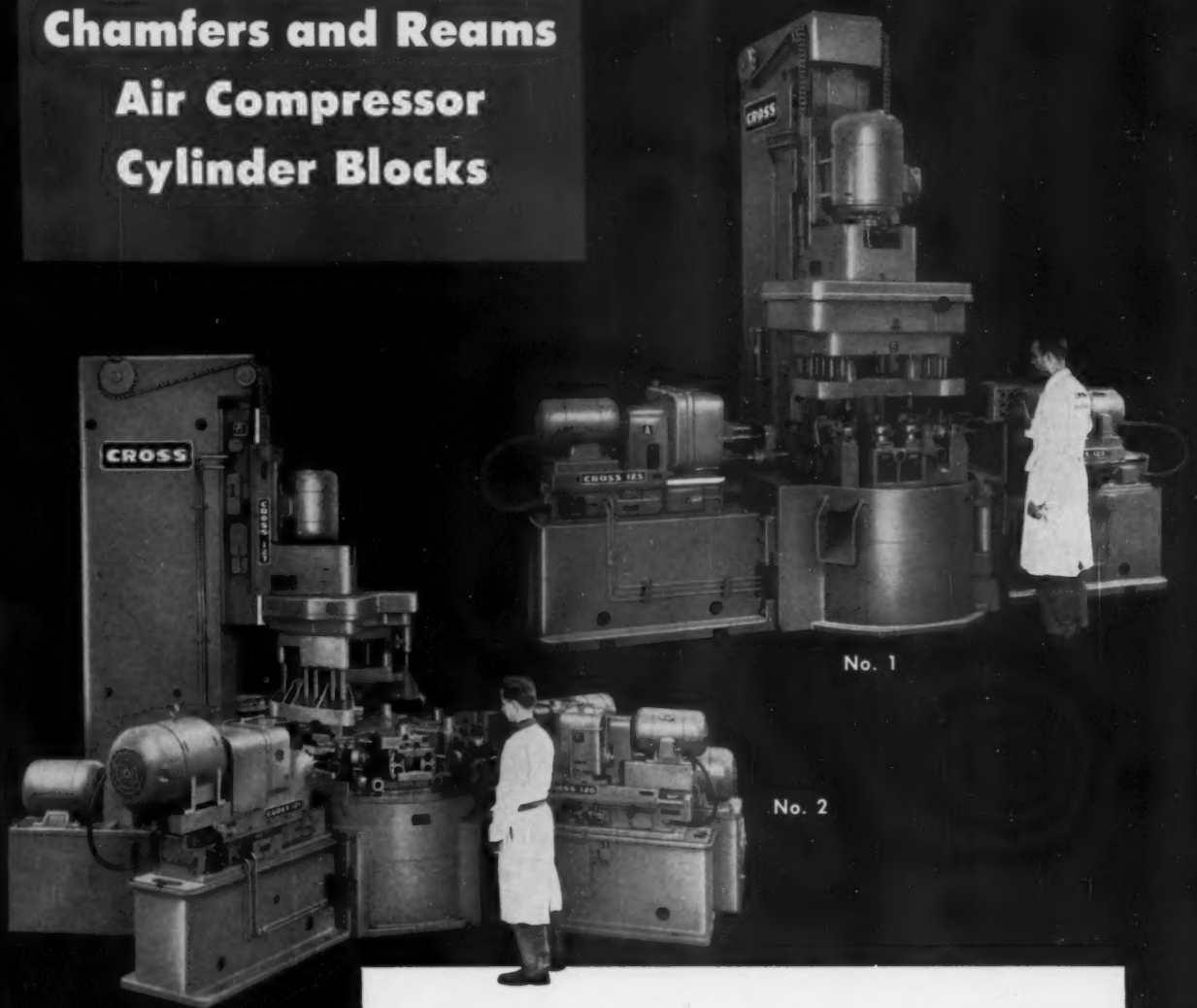
INDUSTRIAL AND SCIENTIFIC PRODUCTS DIVISION

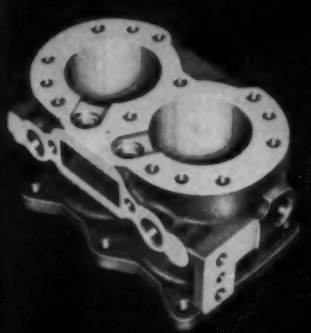
**CURTISS-WRIGHT**

CORPORATION • CALDWELL, N. J.

*More Specials by Cross*

# Bores, Drills, Chamfers and Reams Air Compressor Cylinder Blocks



★ Rough and semi-finish bores cylinders; rough and finish counterbores valve ports; drills, chamfers and reams all holes.

★ 129 pieces per hour at 100% efficiency.

★ Machine Number One has 4 stations; 1 for loading, 3 for drilling, chamfering and reaming. Machine Number Two has 7 stations: 1 for loading and 6 for machining.

★ 2 position, progressive type work holding fixtures for both machines, each arranged to handle 6 similar parts.

★ All parts in Cross machines—even tooling details—are made to interchangeable tolerances for fast, easy maintenance and flexibility for part design changes.

★ Other features: Construction to JIC standards; hydraulic feed and rapid traverse; hardened and ground ways; automatic work cycle.

*Established 1898*

THE CROSS CO.

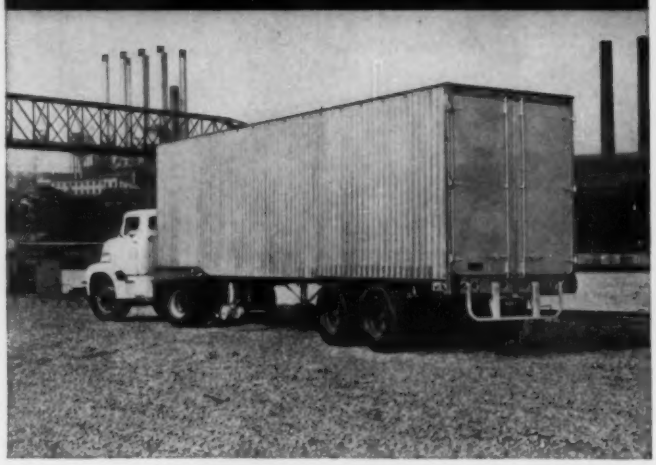
*First in Automation*

DETROIT 7, MICHIGAN

# You can draw and form them LITTLE

. . . . . .

# or fabricate them BIG



# with the new A-L low-nickel STAINLESS GRADES

**WRITE FOR THE ASSISTANCE YOU NEED**

**1. "TECHNICAL STUDIES #3"**

. . . essential information on the composition, properties, fabricating methods and applications of AL chromium-manganese, low-nickel stainless steels. *Write for your copy.*

**2. TEST SAMPLES**

. . . We'll be glad to supply engineering assistance, and actual samples of these 200-Series steels for testing under your processes and conditions.

**ADDRESS DEPT. A-772**

In the top photograph, the fabrications you see are a mixing bowl, a tea-kettle base, a lock case and a patented shoe fastener: all made of A-L Type 201 or 202 chrome-manganese low-nickel stainless. The finish is good, the steel handled the same in the presses as Types 301 or 302, and similar drawing, buffing and polishing procedures were followed.

As in the lower illustration, the chrome-manganese low-nickel grades are being used also for fabrications as large as truck trailers and railroad coaches. Again, forming qualities and weldability present no problems, and results are entirely satisfactory.

Sum it all up and this is the answer: you *won't* encounter any particular differences in fabricating the 200-series of stainless steels . . . you *will* find some advantage in price, and a very important factor of much greater availability in times of nickel shortage. ● Why not take advantage of our pioneering experience with the low-nickel grades—let us help you use them. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

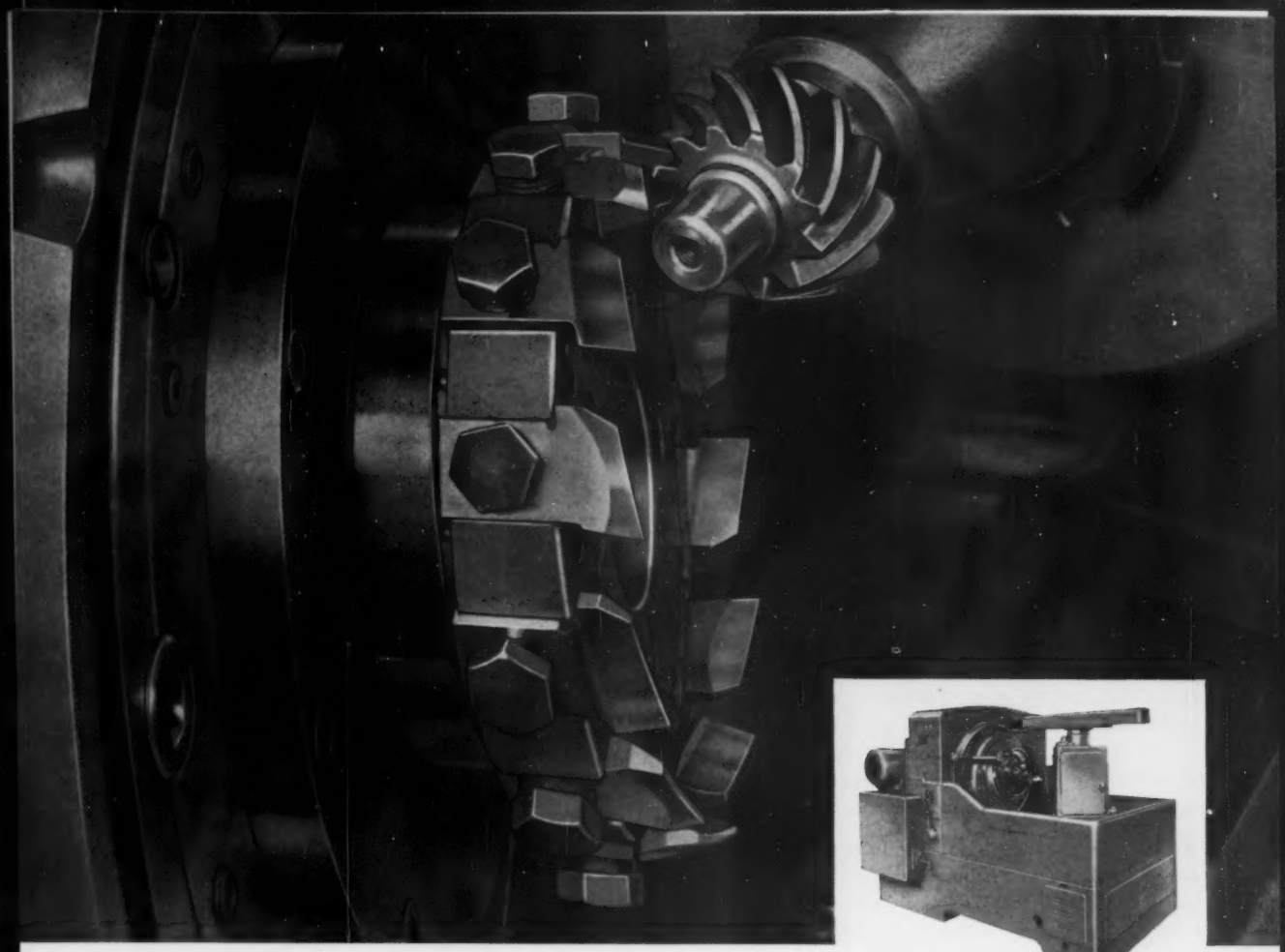
WSW 6063

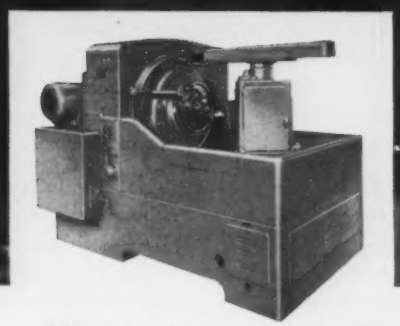
**For Stainless Steel in ALL Forms—call**

# Allegheny Ludlum

**Warehouse stocks carried by all Ryerson Steel plants**

AL STAINLESS STEEL ®





*Jobbing or production quantities are efficiently handled with the new Gleason No. 106 Hypoid Generator.*

# This new generator cuts medium-size bevel gears *faster than ever!*

Several things have been done to make this new Gleason No. 106 Hypoid Generator the fastest machine for producing medium-size bevel gears.

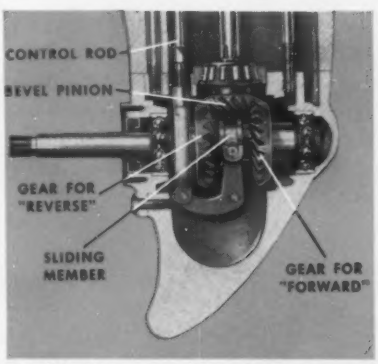
For example, new generating and feed mechanisms coupled with rigid construction give more efficient cutting cycles, speeding up cutting time. In addition, the new generating method assures excellent finish, and maximum cutter life.

**Few adjustments required**

Since fewer adjustments are necessary, faster setup and change-over are attained.

Extreme operating flexibility is one of the outstanding features of the 106. This permits its use for jobbing, production and completing. When it is arranged for completing, gears are finished directly from the solid blank.

This machine handles gears from 2″ to 8½″ diameter, 4DP and finer, with ratios up to 10/1, cone distances up to 5¼″. We will gladly send you more details on request.




*Spiral bevel gears similar to those in this outboard motor drive are cut accurately and quickly on this Gleason machine.*

**GLEASON WORKS**

*Builders of bevel gear machinery for over 90 years*

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

48

ONE OF A SERIES . . .

# What makes a cylindrical roller bearing good?

# WELL-MADE, VERSATILE OUTER RACES

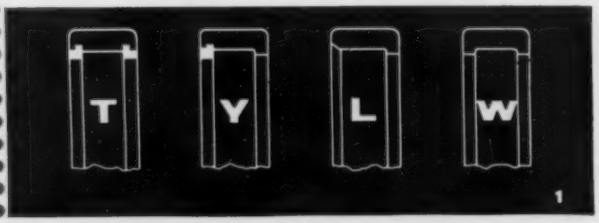
**Outer races are vital parts of all roller bearings, except where housings can provide hardened and ground operating surfaces. In housings of aluminum, cast iron or un-heat-treated steel, outer races assure a dependable roller pathway.**

**While the outer race is not normally the critical member of the bearing, it can still suffer fatigue failure, like all objects subjected to stress repetitions. Therefore HYATT outer races are manufactured with the same scrupulous care that we apply to inner races and all other components of HYATT Bearings. We supply a wide variety of outer races, which makes HYATTS versatile enough to fit practically any design requirements. Some of these application and operating advantages are briefly covered at the right.**

**You'll find more details in HYATT General Catalog No. 150, or your nearby HYATT Sales Engineer will gladly help you choose the type best suited to your needs. Remember, HYATT is America's *first* and *foremost* maker of roller bearings. Hyatt Bearings Division of General Motors, Harrison, New Jersey.**

GM GENERAL MOTORS

HYATT ROLLER BEARINGS

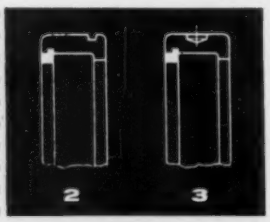



### 1. OUTER RACE TYPES

HYATT Hy-Load outer races are available in a variety of standard configurations (Figure 1). W, L and Y races have solid flanges, which sustain light or intermittent thrust loads. T and Y races with internal snap rings have equal radial load-carrying capacity but are not recommended for applications under continuous thrust. T, Y, L and W races may all be mounted using roller ends against the solid shoulder or internal snap ring for purposes of locating the outer race axially.

### 2. CIRCUMFERENTIAL LOCATION

An ample choice of outer race locating methods may be used with HYATT Hy-Loads. Circumferential location is often by a press fit. (Generally the rotating race should be applied with a press fit and the stationary race with a push fit.) When a push fit is used, axial clamping against the race ends provides satisfactory circumferential location. Positive circumferential location is provided by an outer race dowel.



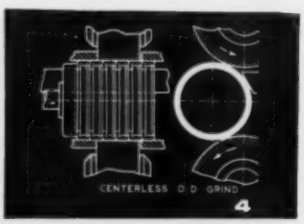

### 3. AXIAL LOCATION

Axial location of an outer race is usually by pressing or pushing the race to a housing shoulder. The race may be prevented from "walking out" of the housing bore by the flange or snap ring operating against the roller ends. Axial clamping against a housing shoulder or snap ring provides positive axial location. However, if a shoulder is not available in the housing, an auxiliary holding device such as an external snap ring or an outer race dowel is needed. HYATT Hy-Load Bearings can be supplied to original equipment builders with outer races having a snap ring groove (Figure 2) or a blind dowel hole (Figure 3), at moderate increase in cost.

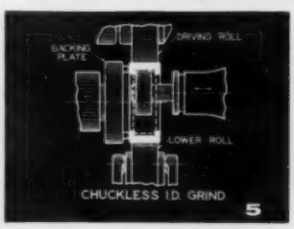
### 4. OPERATIONAL REQUIREMENTS

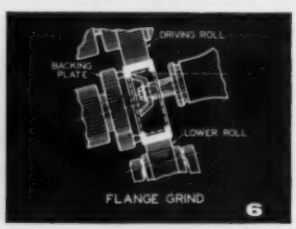
Quality controls are rigidly applied to all HYATT outer races to maintain: a. Minimum wall variation; b. minimum runout of race ends to bore; c. minimum runout of race flange inner faces to bore; d. minimum pathway and outer diameter taper; e. minimum outer diameter tolerance.

### 5. MANUFACTURING PROCEDURES




After careful primary machining and heat treating, ends are faced off square and parallel by a double end grind. This provides a reference surface from which all runouts and squareness can be gaged. Outer race diameters are generated by the centerless grinding method to provide an O.D. with as little out-of-round as practical. The through-feed method is a valuable economy (Figure 4). Next, the pathway (or race I.D.) is ground centerless, generating a cylinder concentric with the O.D. cylinder, by driving the race on the O.D. and positioning the grinding wheel relative to the drive roll (Figure 5). Finally, flanges are ground using the race ends as a reference. The result is a race of as nearly perfect geometry as is practical (Figure 6). Critical final inspection completes the procedures.



# Galvanizing in 1965?

WEAN

*advanced engineering will provide the answer*

THE DEMAND for galvanized steel is constantly on the increase. This, of course, has resulted in a need for faster, more efficient galvanizing lines. In recent years, Wean has contributed greatly to the development of continuous lines for both hot dip and electrolytic galvanizing.

TO THIS END, Wean has brought together perhaps the finest group of mill equipment engineers in the nation. Their assignment: to constantly study galvanizing and keep Wean lines first and foremost in the industry. We believe the accumulated knowledge and the advanced engineering techniques of such an accomplished team will, as it has in the past, supply the answer to the question of galvanizing in 1956, 1970 or, for that matter, in the year 2000.

*The* WEAN ENGINEERING COMPANY, INC.
WARREN, OHIO

9158

# HOW TO PUT HALLOWELL SHOP DESKS TO WORK IN YOUR PLANT

## BUY THESE STANDARD MODELS

MODEL 406

MODEL 409

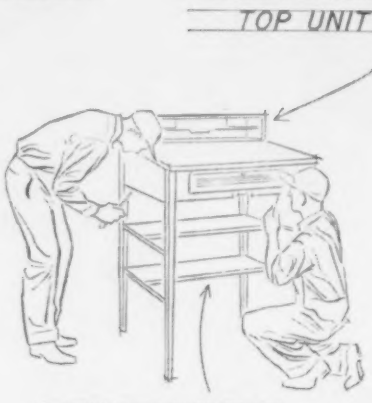
MODEL 400

## OR USE INTERCHANGEABLE PARTS TO CUSTOM BUILD THESE DESKS

PIGEONHOLE TOP UNIT

SINGLE DRAWER TOP UNIT

DESK BODY UNIT



LOWER SHELF

ADD EXTRA DRAWERS

Sturdy steel for years of use · Large, smooth writing surface · Drawers that glide on roller bearings, have recessed drawer pulls · Built-in lock · Green baked-on enamel finish · Stocked by leading shop equipment dealers · Ask for Bulletin 728 · Hallowell Shop Equipment Division, Standard Pressed Steel Co., Jenkintown 17, Pa.

HALLOWELL SHOP EQUIPMENT DIVISION

STANDARD PRESSED STEEL CO.

SPS

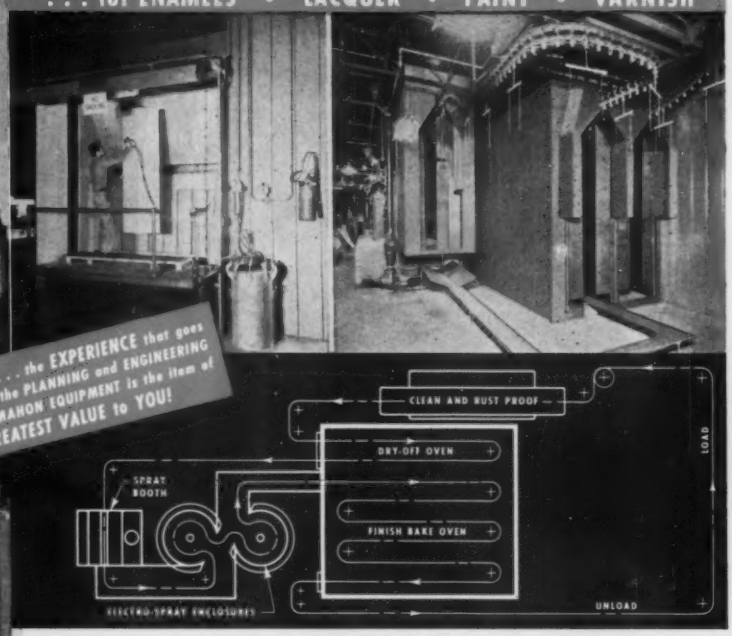
JENKINTOWN PENNSYLVANIA

BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING

# COMPLETE *Finishing* SYSTEMS

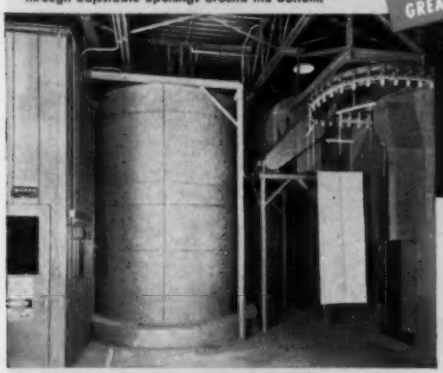
. . . for ENAMELS • LACQUER • PAINT • VARNISH

Ventilated, Circular Electrostatic Spray Enclosure. Disc Applicator travels up and down. Air is exhausted through adjustable openings around the bottom.



. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



Exterior of one of the two Circular Electrostatic Spray Enclosures. Air Exhaust Duct is continuous around the bottom.

Exit end of Finish Baking Oven. In this installation the Dry-Off Oven and Finish Baking Oven are combined in one unit.

## *Compact MAHON SYSTEM Finishes 2000 "SLIMFOLD" Metal Closet Doors Per Day!*

The finishing equipment shown here is a Complete Mahon Finishing System designed especially to do a particular job for Temes Steel Company, Detroit. It includes facilities for cleaning, rust proofing, drying, spray painting, electrostatic coating and finish baking on both sliding and folding metal closet doors. This is a typical example of Mahon's service to industry. No matter what your finishing requirement may be, it will pay you to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you will find them better qualified to advise you, and better qualified to do the all-important planning, engineering and coordinating of equipment, which is the key to fine finishes at minimum cost. And, if you care to investigate, you will find that Mahon equipment will serve you better . . . because Mahon equipment is engineered better and built better for more economical operation over a longer period of time. See Mahon's Insert in Sweet's Plant Engineering File for further information, or write for Catalog A-656. Better still, why not have a Mahon engineer call at your convenience.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

# MAHON

# happy balance between dependable performance and moderate cost

## ROLLWAY STEEL CAGE ROLLER BEARINGS

**Tru-Rol** *precision, steel-cage, heavy-duty bearing with contoured guide lips assuring true right-line rolling, maintained roller alignment and thin oil film.*

● Rollway's *TRU-ROL* Steel-Cage Bearings afford wide latitude in balancing *dependable* performance, *long* life, and *high load* capacity against *moderate* cost. They rate high in any comparison on a cost-performance basis.

A choice of stamped steel retainers with contoured guide lips, or steel segmented retainers assure true rolling and an evenly distributed *thin* oil film — *big factors in reducing power losses and heating.*

### "Crowned" Rollers Relieve End Stress

*TRU-ROL* offers the extra advantage of a finish-ground "crown" radius on the roller ends. That relieves high end-stress and insures uniform load distribution over the entire length of the roller. The result: *TRU-ROL* Steel Cage Bearings carry heavier loads over longer periods without excessive end-fatigue. They are less affected by slight misalignment or shaft deflection.

Investigate *TRU-ROL* Steel Cage Roller Bearings before selecting any bearing in the medium price range.

TYPE D

**Rollway Metric Series Steel Cage Roller Bearings**

● Rollway Metric Series Steel-Cage Bearings offer the greater load capacity of solid cylindrical rollers, plus the true right-line rolling of trunnion rollers turning in a rigid steel cage. There's no roller skew, no pinch out, no cam action. Design permits maximum bearing capacity . . . within small space . . . at moderate cost.

## Let Rollway Help...

Our complete engineering and metallurgical services will gladly work with you on your problem. Simply write or wire any sales office. No cost. No obligation.

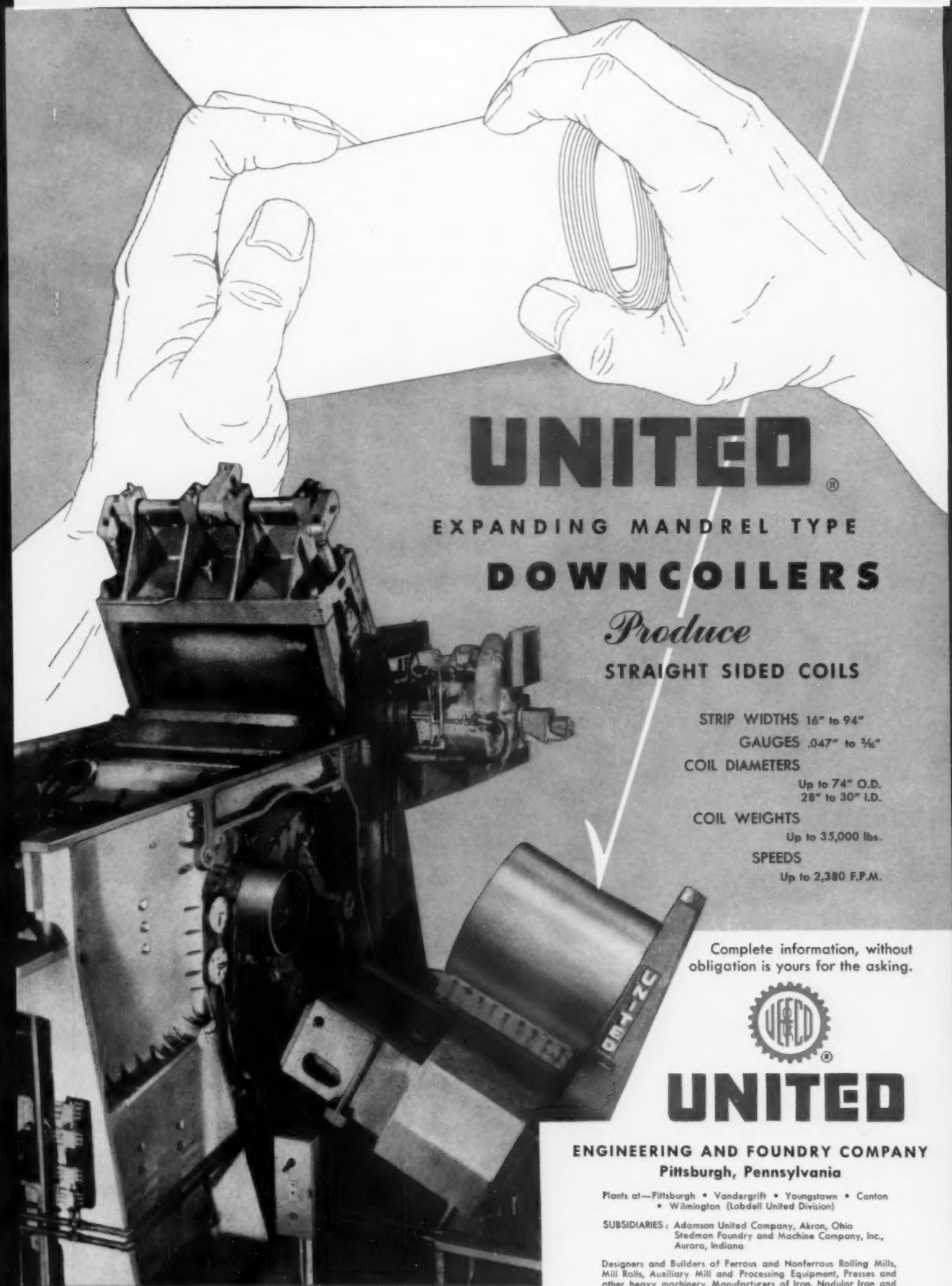
Rollway Bearing replacements are available through authorized distributors in principal cities. Consult your classified phone directory.

**ROLLWAY BEARING CO., INC. SYRACUSE, N.Y.**

**ROLLWAY BEARINGS**

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

**ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Milwaukee • Seattle • Houston • Philadelphia • Los Angeles • San Francisco**



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## EXPANDING MANDREL TYPE

# DOWNCOILERS

*Produce*

**STRAIGHT SIDED COILS**

STRIP WIDTHS 16" to 94"

GAUGES .047" to 3/16"

COIL DIAMETERS
Up to 74" O.D.
28" to 30" I.D.

COIL WEIGHTS
Up to 35,000 lbs.

SPEEDS
Up to 2,380 F.P.M.

Complete information, without obligation is yours for the asking.

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# UNITED

**ENGINEERING AND FOUNDRY COMPANY**
**Pittsburgh, Pennsylvania**

Plants at—Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington (Lobdell United Division)

SUBSIDIARIES: Adamson United Company, Akron, Ohio
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Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

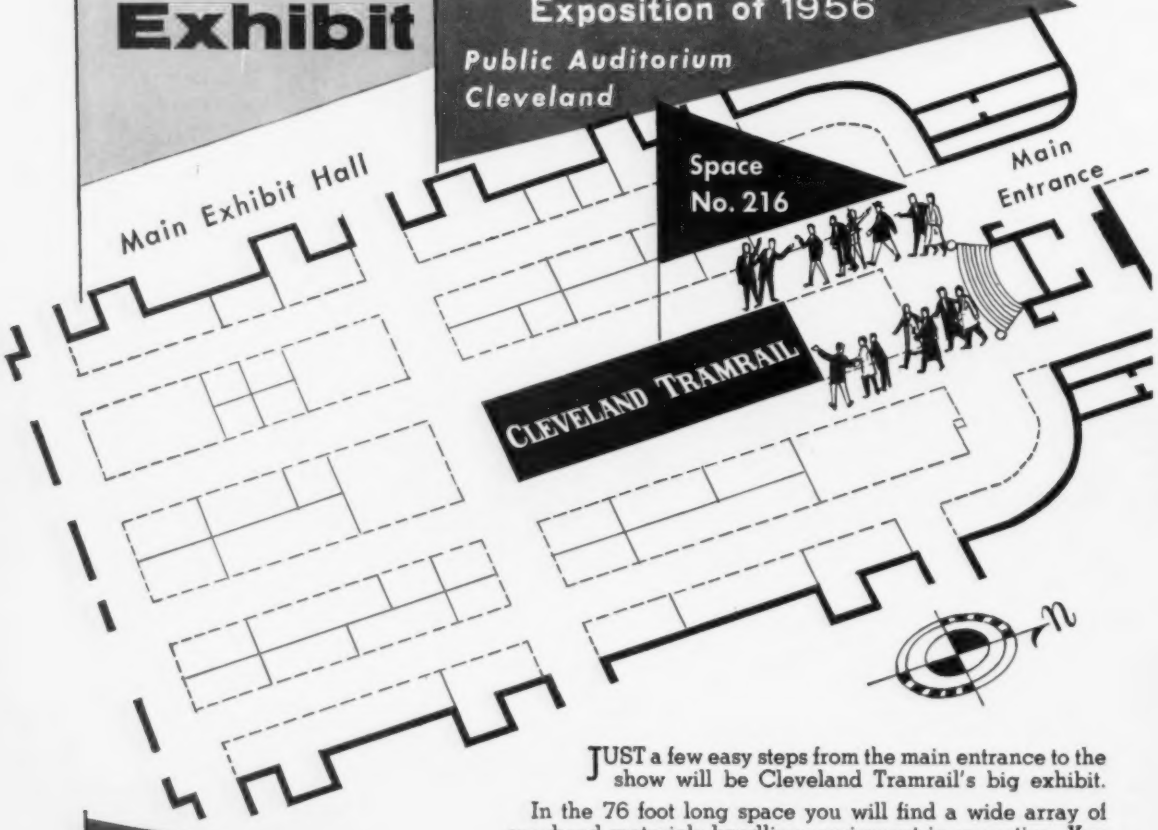
# Here's the Fastest, Most Efficient

# See Cleveland Tramrail's

# Big Exhibit

at the
Material Handling Institute's
Exposition of 1956

*Public Auditorium*
*Cleveland*




JUST a few easy steps from the main entrance to the show will be Cleveland Tramrail's big exhibit.

In the 76 foot long space you will find a wide array of overhead materials handling equipment in operation. You will be able to see and study first hand what makes Cleveland Tramrail equipment so outstanding that over 9,000 plants in the United States and Canada have more than 40,000 installations of it for lightening the work and speeding production.

*You will see important new items and improvements:*

### New Manually-Operated Switch

Heavy slide rod construction enables smoother operation. More positive lock mechanism. Wearing parts including track sections easily replaced.

### New Switch Motorization

Rugged, simplified construction assures trouble-free track switch operation.

### New Tractor

Powerful unit with greater wheel traction. Heavier gearing, more easily reached, requiring removal of only one gear cover.

### New "Power and Free" Attachment

New tractor attachment releases drive wheels from track. Permits easy tractor movement during manual propulsion. Valuable for many automatic handling systems.

### New Roll Grab

Hydraulic operation. Smoother running. More positive grip. Fewer moving parts, easier to reach. Handles rolls in vertical or horizontal position and turns from one to the other. Grab on exhibit handles rolls to 6000 lbs., from 24 to 60 inch diameter, from 36 to 84 inch long.

*Cleveland Tramrail Division*
**The Cleveland Crane & Engineering Co.**
**Wickliffe, Ohio**

**CLEVELAND TRAMRAIL**

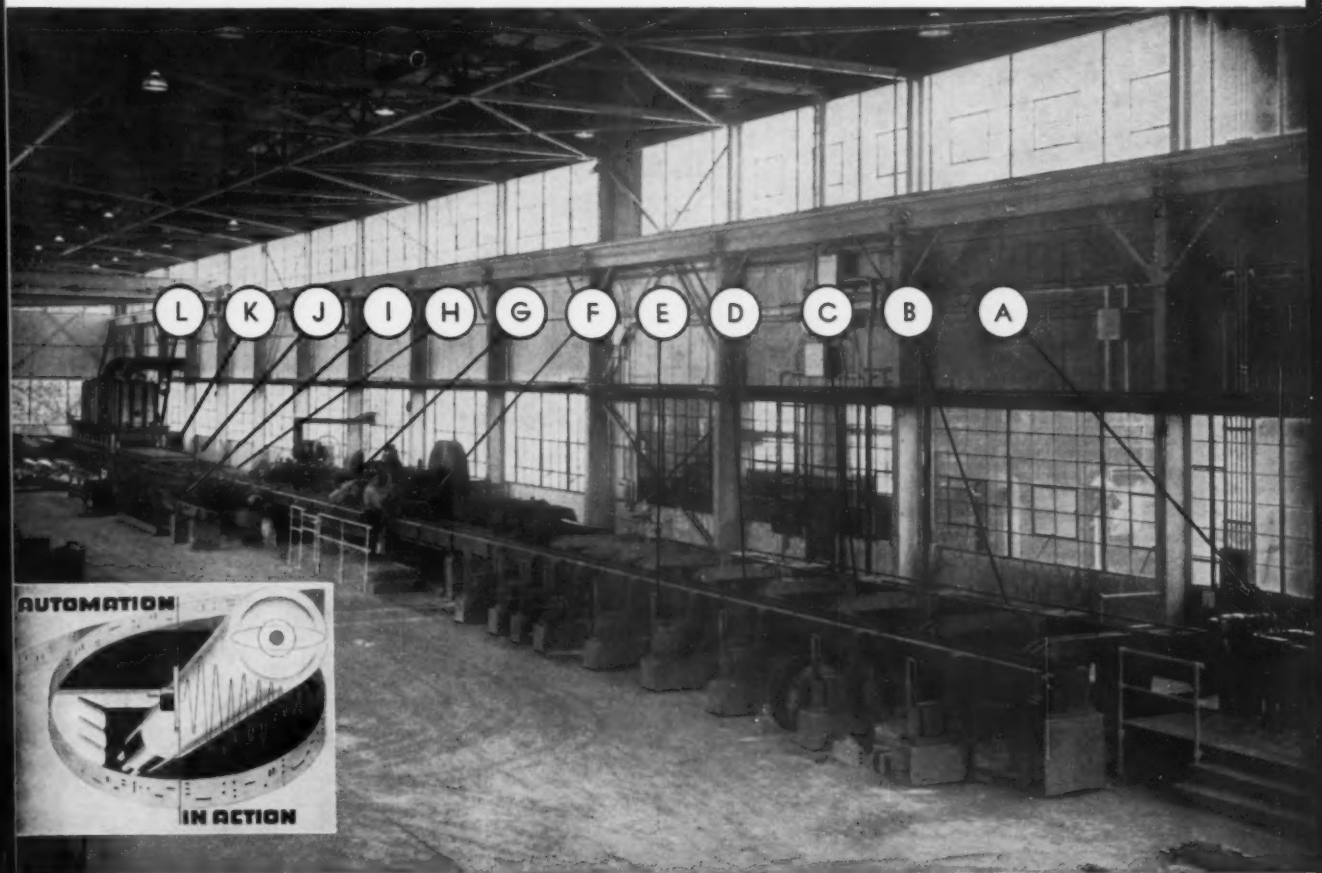
# Here's the Fastest, Most Efficient Cold Draw Processing Line Available

The McKay Automated Line that automatically handles and processes hot rolled bars through cold drawing, shearing and straightening in a continuous cycle has proved itself to be far and away the fastest, most efficient cold draw processing operation in action today. Users are finding they can effect great labor savings while actually boosting production, and at the same time get a more uniform product.

Hot rolled, pickled bars are push pointed, drawn, sheared to length, and straightened in a single, continuous operation with no intermediate handling of any type. Hold down and crop gauging on a multiple shear, plus automatic length gauging, permits the shearing operation to keep pace with the maximum drawing cycle. Sheared bars are automatically entered into the straightener which operates at speeds high enough to enable a continuous straight-line flow of bars.

**Does the line pay off?** Three of four companies now using these lines say they have already paid for themselves and are contemplating the purchase of additional units.

CAN YOU AFFORD TO OPERATE WITHOUT SUCH COST SAVING EQUIPMENT? Remember handling adds nothing to the value of your product. Why not look over the McKay line of automated processing-handling equipment? Why not talk it over with a McKay engineer? There's no obligation.




**A—Hydraulic Push Pointer** Eliminates pointing prior to drawing. Minimizes point scrap.

**B—Multiple Bar Draw Bench** One, two or three bars at a time.

**C—Horizontal Pneumatic Transfer Arms** Takes drawn bars from bench and deposits them on driven shear entry table.

**D—Shear Entry Table** Conveys drawn bars to the shear.

**E—Auxiliary Racks**

**F—Multiple Bar Shear** Has capacity to shear same number and sizes of bars that are drawn.

**G—Cut-to-Length Gauge Table** Automatic cut-to-length and crop gauges.

**H—Shear Run-out Table** Driven table conveys sheared bars to straightener entry table.

**I—Transfer Skids** Entry to straightener table.

**J—Automatic Straightener Entry Table** Completely automatic feed from transfer skids into straightener.

**K—Straightener**

**L—Straightener Exit Table and Racks**

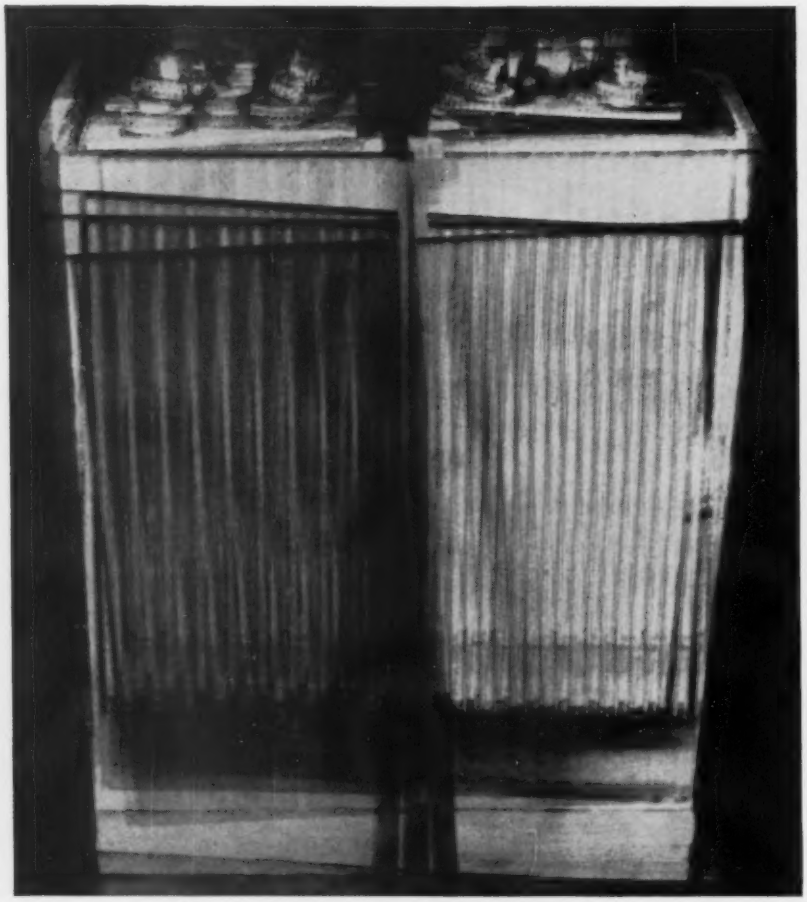
The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

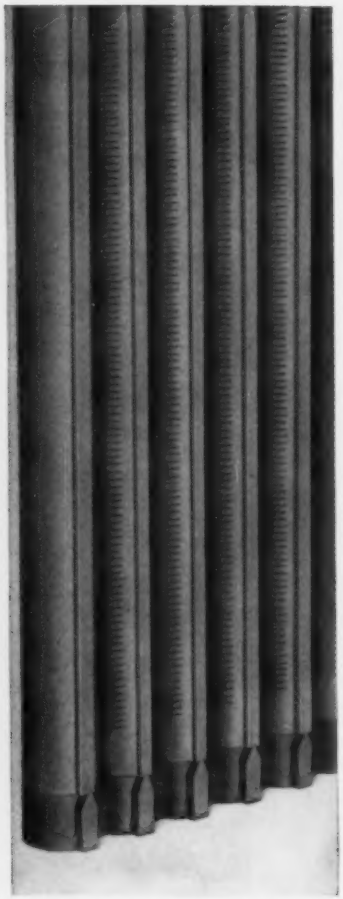
ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

# EXIDE-IRONCLAD BATTERIES

## For electric industrial truck operation

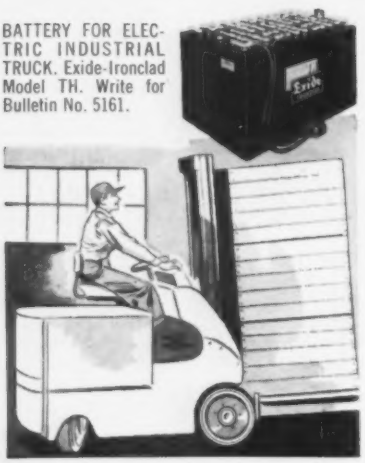


Actual photo taken during vibration torture test on an Ironclad Battery



Section of Ironclad positive plate

## Vibration can't loosen active material — can't shorten battery life



BATTERY FOR ELECTRIC INDUSTRIAL TRUCK. Exide-Ironclad Model TH. Write for Bulletin No. 5161.

When a heavy duty storage battery gets the "shake treatment," battery life is literally at the mercy of the bond between the positive grid and the active material. Heavy shedding means short life.

But look what happens in an Exide-Ironclad Battery. Active material is held firmly captive inside the plastic power tubes. Hair-thin slits let electrolyte in, but keep active material from falling out. In prolonged vibration tests, this unique design has proved to be a valuable battery life stretcher. These findings are confirmed in the long, dependable service of Exide-Ironclad Batteries in typical high-vibration applications.

This superior performance is only one of the many extra advantages in Exide-Ironclad Batteries — advantages that have earned them an unmatched reputation for long life and high capacity. When you order heavy duty batteries, or the equipment that requires them, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

*186 Million tons of hot metal* from blast furnaces lined with*

NATIONAL
TRADE-MARK

**CARBON MATERIALS**

# APPROVED

| | | |
|---|---|---|
| 11 linings with 3 to 3-1/2 million tons . . . . | total | 36 millions |
| 10 linings with 2-1/2 to 3 million tons . . . . | total | 27 millions |
| 12 linings with 2 to 2-1/2 million tons . . . . | total | 28 millions |
| 19 linings with 1-1/2 to 2 million tons . . . . | total | 32 millions |
| 20 linings with 1 to 1-1/2 million tons . . . . | total | 24 millions |
| Total for linings with over 1 million tons . . | | 147 millions |
| Total for linings with less than 1 million tons . . | | 39 millions |
| **Grand Total as of January 1, 1956 . 186 millions** | | |

***Get complete information and history of this impressive record from your National Carbon Company representative.***

*Includes basic iron, merchant iron and ferro-manganese.

*The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation.*

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# star performer

## ...and among high speed steels

## REX is the leader

Crucible REX® high speed steel has been the winner in shop tests for more than fifty years. *And now REX is even better than ever!* For Crucible research and experience has led to improved manufacturing techniques that mean higher quality – greater uniformity.

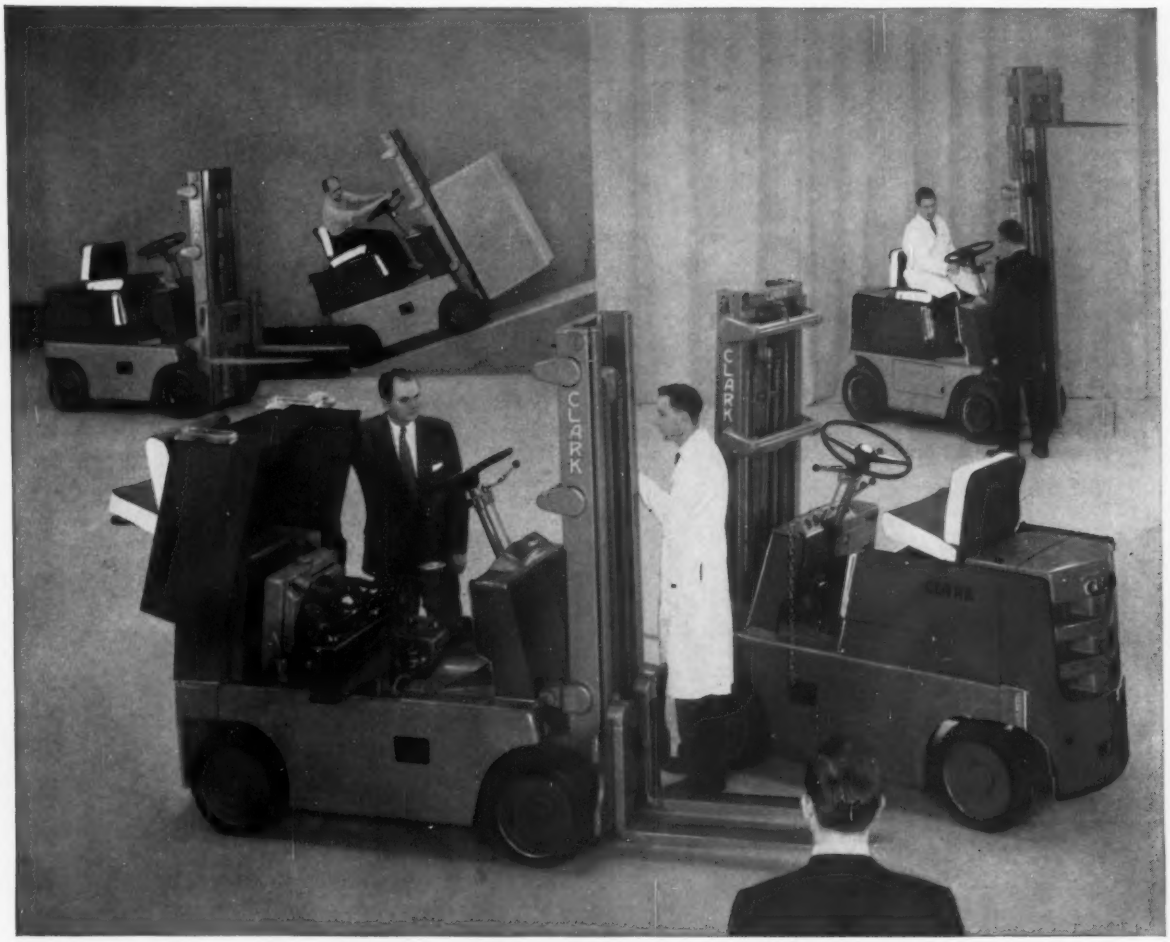
Prove the superiority of REX for yourself – on your next job. Check it for size, structure, response to heat treatment, all-around tool performance. Then you'll know why REX has always been the *standard by which other high speed steels are compared.*

REX is immediately available at all of Crucible's convenient warehouses – or through prompt mill delivery. For a list of available data on REX and other Crucible *special steels*, write for a free copy of the "Crucible Publication Catalog". *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

**CRUCIBLE** first name in special purpose steels

**Crucible Steel Company of America**

Canadian Distributor — Railway & Power Engineering Corp., Ltd.




# *Get a* ***REAL*** *lift—*

## *see the all-new Clarklift "Leadership Line"*

Now, after three years and thousands of engineering and test hours, here is the best design, the most serviceability, the safest and finest performance ever built into one lift truck.

For easy servicing, see how the *entire* hood folds back. Look at the miracle of a longer wheel base in the same over-all length; tighter turning radius too.

Lifting speeds are increased 50% . There's more engine power. Gradeability and tractive effort are increased, yet control of movement is more precise than ever.

Safety? Comfort? Look at the dead man brake, simplified directional controls, extra-wide adjustable seat, less braking effort, and easy steering.

That's just the beginning. This is a completely new truck with dozens of new ideas . . . ideas you wanted in the *ideal* lift truck. Soon your dealer can show them in models ranging from two to five thousand pounds. See him . . . you'll get a real lift.

**CLARK®**
**EQUIPMENT**

*Industrial Truck Division*
*CLARK EQUIPMENT COMPANY*
*Battle Creek 51, Michigan*

LEADERS IN INDUSTRIAL SAFETY: JOHNSON MOTORS

Industrial safety is as vital to Johnson Motors as the production of fine outboard motors. The fire hazard that die-casting equipment ordinarily creates has been controlled at Johnson through the use of fire-resistant Pydraul hydraulic fluid.

## FIRE-RESISTANT PYDRAUL F-9 CHANGES FIRE ZONES TO SAFETY ZONES

275 million hours of actual in-use operation—without a single hydraulic fire—*proves* the safety and dependability of fire-resistant Pydraul hydraulic fluid.

But Pydraul gives you more than safety. You can be sure of long equipment life with low maintenance . . . because Pydraul lubricates like a premium petroleum oil. You'll save money on fluid consumption, too! Pydraul is reclaimable—you can return spillage to the system, use it again and again.

Make a quick check of your hydraulic equipment . . . calculate your fire risk if it's close to hot metal, electrical contacts, open flame or other heat sources. Then talk to a Monsanto representative. He will show you how easy it is to convert to Pydraul . . . giving you a future of positive safety from hydraulic fires . . . at low cost per year.

**PYDRAUL MEANS:**

Fire Resistance
Excellent Lubricity
High Stability
No Corrosion
Re-use, Again and Again

Write now for new booklet, "PYDRAUL F-9." Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Dept. PYD-2, St. Louis, 1, Mo.

**PYDRAUL F-9**—First and Only Hydraulic Fluid Listed by Underwriters' Lab.

On May 31, 1955, Pydraul F-9 became the first fire-resistant hydraulic fluid listed by Underwriters' Laboratories. From the Laboratories' Service Card: "The fire hazard of (PYDRAUL) is rated 2 to 3 in accordance with Underwriters' Laboratories, Inc.'s Standard of Classification in which Ether rates 100, Gasoline rates 90-100, Alcohol (ethyl) rates 60-70, Kerosene (100° F. flash) rates 30-40, and Paraffin oil rates 10-20." See Underwriters' Laboratories, Inc.'s guide No. 540 18, File MH6049.

*PYDRAUL: Reg. U. S. Pat. Off.*

MONSANTO

WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

in a new car . . .
in a used car . . .

# stainless steel sells and re-sells

The Stainless Steel trim, molding and vital parts that add style and beauty to a car, inside and out, are features that help make the sale.

Stainless Steel has wide customer acceptance. It's easy to clean and keep clean. It's a tough, solid metal that will not corrode or dent and stands up to gravel, ice, salt and water.

The finish never fades and parts are easy to replace. Stainless Steel lasts the life of the car. It *sells* in a new car and it *re-sells* in a used car.

# McLOUTH STAINLESS STEEL for automobiles

McLOUTH STEEL CORPORATION
*Detroit, Michigan*

***Manufacturers of Stainless and Carbon Steels***

# Here's how you can help make stainless plate stocks go a LONG way...

Whenever demand outdistances supply you have problems. But any problem can be solved when all hands cooperate. If you keep in mind these "rules of the road" you will be able to add extra mileage to the supply . . .

1. If you have a D.O. rating, give it to your supplier—it helps him get the necessary nickel, and protects your position on his schedule.
2. If you are going to cut plate into smaller pieces, give your supplier the option of furnishing small pieces.
3. Plan ahead as much as possible, so your supplier has a reasonable chance to meet your delivery requirements.
4. If an alternate analysis or a slight variation in gage is acceptable, let your supplier know.
5. Buy "cut-to-shape" pieces and reduce your time and costs of handling scrap.
6. Clean out your stainless scrap so that it can get back into production.
7. Order only what you need in stainless plate—to exact size.

Put these simple rules to work . . . it will help you, and all of us, stretch the supply to the limit.

*Stainless Steels Exclusively*

**G. O. CARLSON, INC.**

**Plate • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)**

**THORNDALE, PENNSYLVANIA**

***District Sales Offices in Principal Cities***

# Helps put the "B-G" in the BiG New 1956 LINCOLN

## . . . the PRATT & WHITNEY KELLER Type BG-22

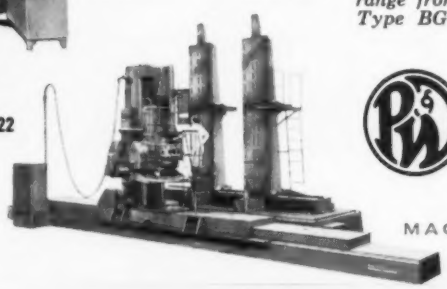
Hallmark of Lincoln styling is a distinguished, lithe, trim look with gracefully flowing lines. Producing the huge dies that faithfully translate the designer's drawing board dream into a reality of smoothly formed metal is just one of the jobs done so well by Pratt & Whitney Keller Automatic Tracer-Controlled Milling Machines. Shown here is a big Keller Type BG-22. Following a plaster model, it sculptures the complex contours of a rear quarter panel in solid metal . . . quickly, exactly and, above all, economically.

**SMALL . . . or LARGE**

*There's the right size Keller Machine for every plant, for every job. Capacities range from 36" x 20" (for the compact Type BL) to 20' x 7' (for the giant Type BG-22). Write for complete information outlining your requirements.*

TYPE BL

TYPE BG-22



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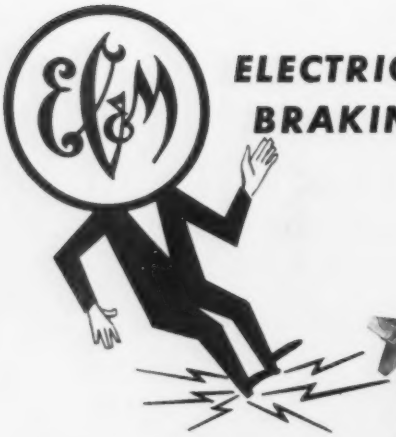
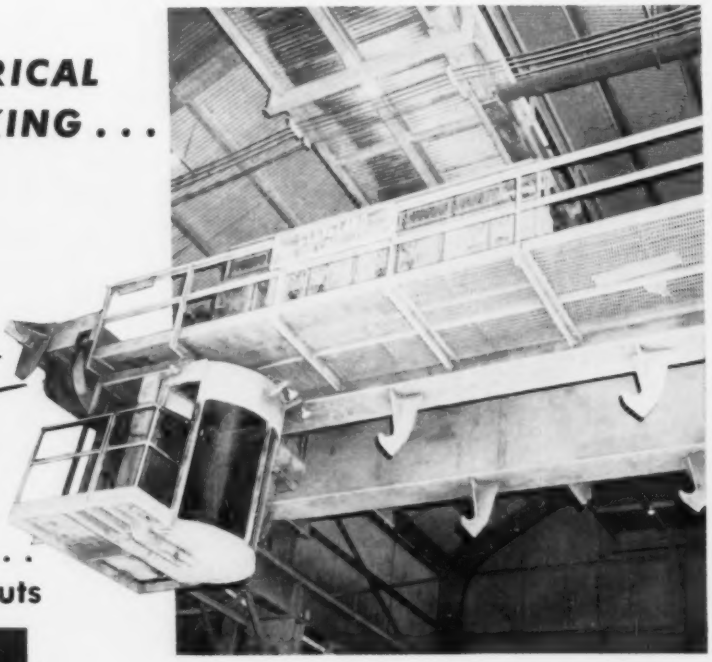
*Direct Factory Representatives in Principal Cities*

MACHINE TOOLS • GAGES • CUTTING TOOLS



**ELECTRICAL BRAKING . . .**



**gives smoother, safer operation . . . lengthens brake life . . . prevents motor burnouts**

Pressure on foot pedal in cab slows down the crane by dynamic braking. Further pressure on pedal applies foot-brake.

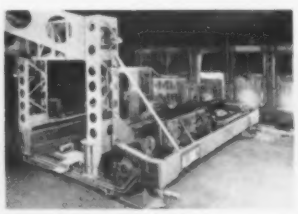
Many advantages have been gained . . . many economics have resulted from the use of electrical braking to slow down the cranes in this plant. In six years of operation, no foot-brake lining required replacement . . . no motor burnouts occurred. These cranes, operating on a 1000-ft. long runway, are easy to stop from high speed . . . or any speed. Braking is quick, smooth, positive, and operators like this less fatiguing method of operation.

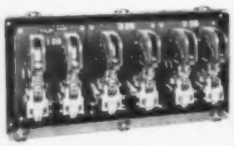
When presented with this problem of applying electrical braking to the bridge motions of these cranes, EC&M engineered a simple Controller of Bulletin 921-2942 design, which was easy to install and easy to operate.

EC&M Control Apparatus and Control Engineering are well-known for providing control *engineered* to the task. For crane-bridge drives, EC&M builds standard reversing-plugging controllers, control giving 2 steps of plugging, and emergency dynamic braking control for full protection should power fail.

Call in an EC&M engineer whenever crane control problems arise. He will be glad to discuss control suited to your application.

**FAIL-SAFE control for stopping Chargers . . . Ore Bridge Trolleys**





The compact 3-contactor Panel, at right above, brings charging machines quickly to rest whenever power fails . . . main power outage, overload relay tripping or failure of collector-shoe circuit. This control has the same advantages for the bridge motions of overhead cranes, larry cars and similar machines.

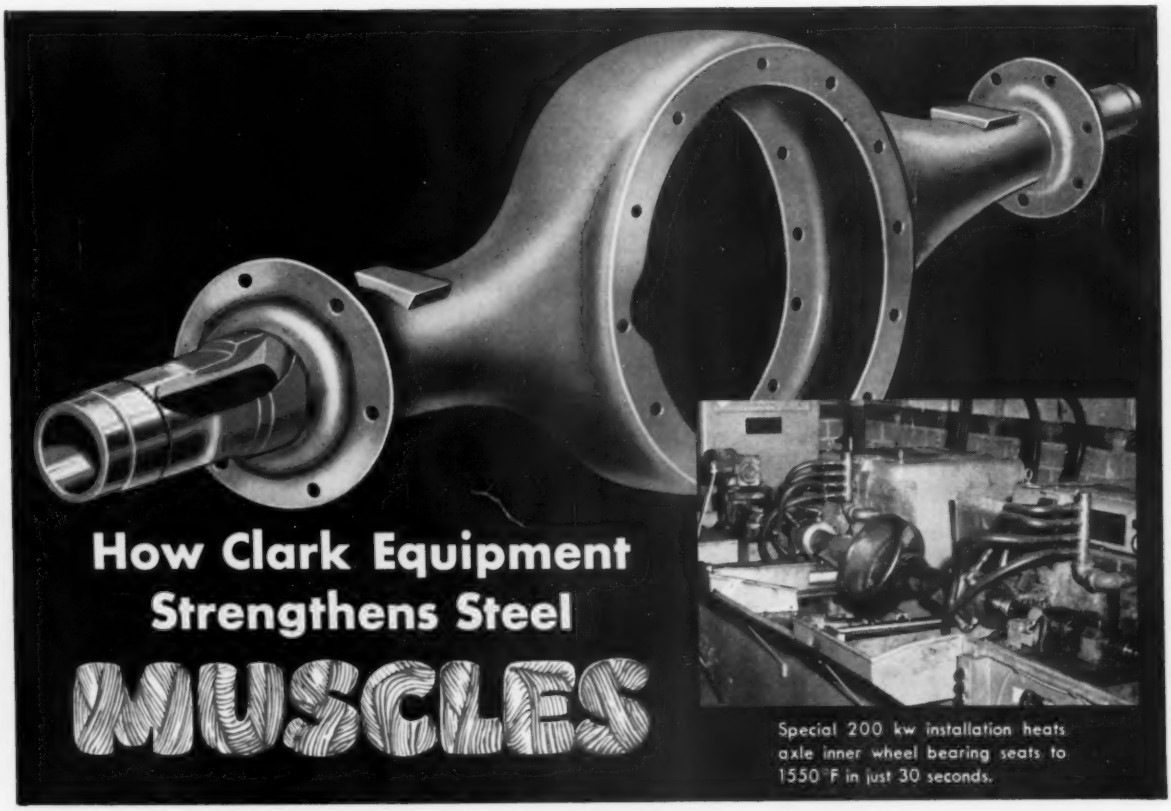
Of Fail-Safe design, this Control instantly changes the driving motors into self-excited generators, whenever power fails, to produce a cushioned, non-skid, quick stop. Panel-height is low for easy mounting on existing machines . . . ready application on new cranes. For complete facts, ask for Bulletin 921-2926.

6823

**THE ELECTRIC CONTROLLER & MFG. CO.**

DIVISION OF SQUARE D COMPANY

4498 Lee Road • Cleveland 28, Ohio


How Clark Equipment
Strengthens Steel
MUSCLES
Special 200 kw installation heats axle inner wheel bearing seats to 1550°F in just 30 seconds.

# with TOCCO* Induction Heating

Progressive engineers at Clark Equipment Company's Axle Division recently adopted TOCCO Induction Heating for hardening the inner wheel bearing seats of their axle housings. TOCCO*-hardening is strictly a "quality specification"—part of Clark's never-ending program of product improvement.

**Look At These Results!** After testing various methods of surface treatment including flame hardening and shot peening, TOCCO induction hardening was selected because the average improvement in fatigue life was greater than with any other type of surface treatment. The improvement in fatigue life with TOCCO equipment is approximately 400%.

In addition to improved fatigue life, surface wear resistance and improved grindability are achieved.

Fatigue test consisted of loading axle housing on spring seats to approximately twice the rated load and stroking at 180 cycles per minute.

| Hardening Process | Per cent Improvement In Fatigue Life Over Standard Production |
|---|---|
| Shot Peening | 50% |
| Flame Hardening | 300% |
| TOCCO Induction Hardening | 400% |

In your search for ways to improve your product to meet today's tightening competition, don't overlook TOCCO as a sound means of improving product quality, increasing production speed and lowering production costs.

**THE OHIO CRANKSHAFT COMPANY**

TOCCO

*Trade Mark Reg. U. S. Pat. Off.

*Mail Coupon Today*

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-5, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____

Position_____

Company_____

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City_____ Zone____ State____

*This Allis-Chalmers 4,000-lb fork lift truck at a New Jersey plant works fast, drives easily, turns in a 72-in. radius for efficient indoor or yard handling.*

# You can expect double savings with an Allis-Chalmers Lift Truck

## 1 Saves Time and Labor

When you put an Allis-Chalmers Fork Lift Truck on the job, the first thing you'll notice is how fast and steady it works. One reason is the ease of operation. You mount from either side — no brake handle or shifting lever to interfere. The seat is comfortable, visibility is excellent. Handling is "second nature" to even the inexperienced operator, because it drives just like an automobile. Result of this operating ease: bonus quantities of material moved every hour.

## 2 Slices Maintenance Costs to the Bone

"It has gone 6,000 hours and still no downtime." "Up and down a steep ramp for 15 months — repair cost only $1.92." Reports like these are not uncommon, as Allis-Chalmers trucks continue to amaze their owners. When repairs *are* necessary, the truck can be disassembled in 22 minutes — stripped for servicing in 22 seconds. Think what that means in savings.

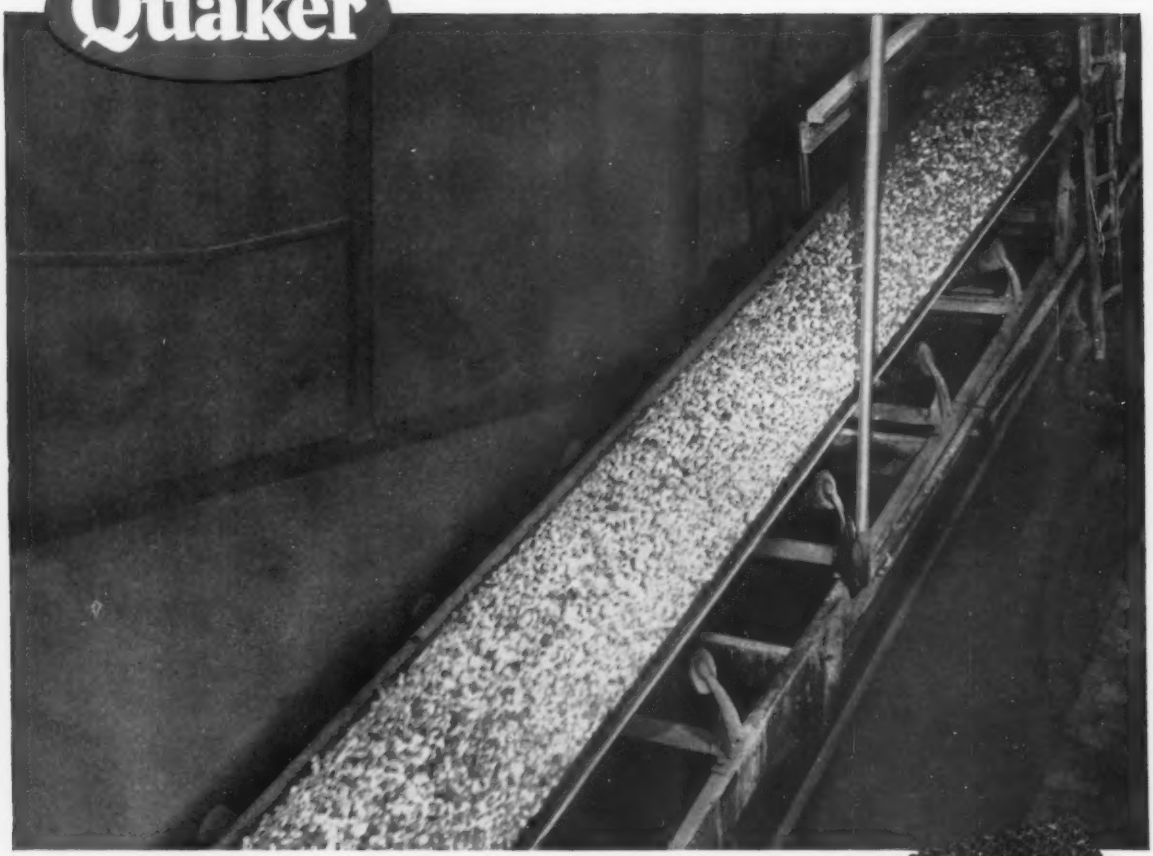
*Let your Allis-Chalmers material handling dealer show you the kind of savings this lift truck can give you. Write for free catalog.*

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

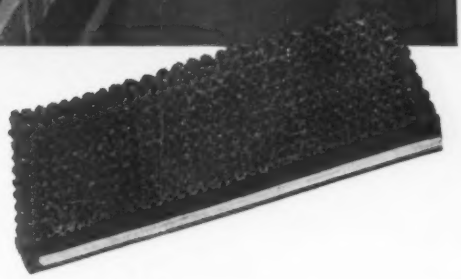
**ALLIS-CHALMERS**

BH-12B

# Quaker



## Maintenance costs slashed by this specially engineered belt



*For speed and savings buy from your industrial supply distributor. He can help you select the right belt for your jobs—and, if necessary, bring you the free consultation service of Quaker-Quaker Pioneer field engineers.*

Are your hot-materials handling jobs taking an unnecessarily heavy toll in belt costs? They needn't—if you use conveyor belts specially engineered for your specific job conditions. Here's a case that gives real weight to that argument. For 11 months this belt hauled 850,000 tons without requiring replacement—more than double the life of belts previously used on this job. It is one of several types engineered by Quaker-Quaker Pioneer for jobs involving temperatures over 400°F. Some, like this one, are rough top construction enabling the belt to react rapidly to cooling methods. Others are of newly developed compounds, exceptionally heat-resistant to prevent hardening and cracking. Get the cost-saving benefit of this specialization by telling us—or your distributor—*your* problems. Our complete line contains everything you need in industrial rubber products, including hose, packing and moulded rubber for every use.

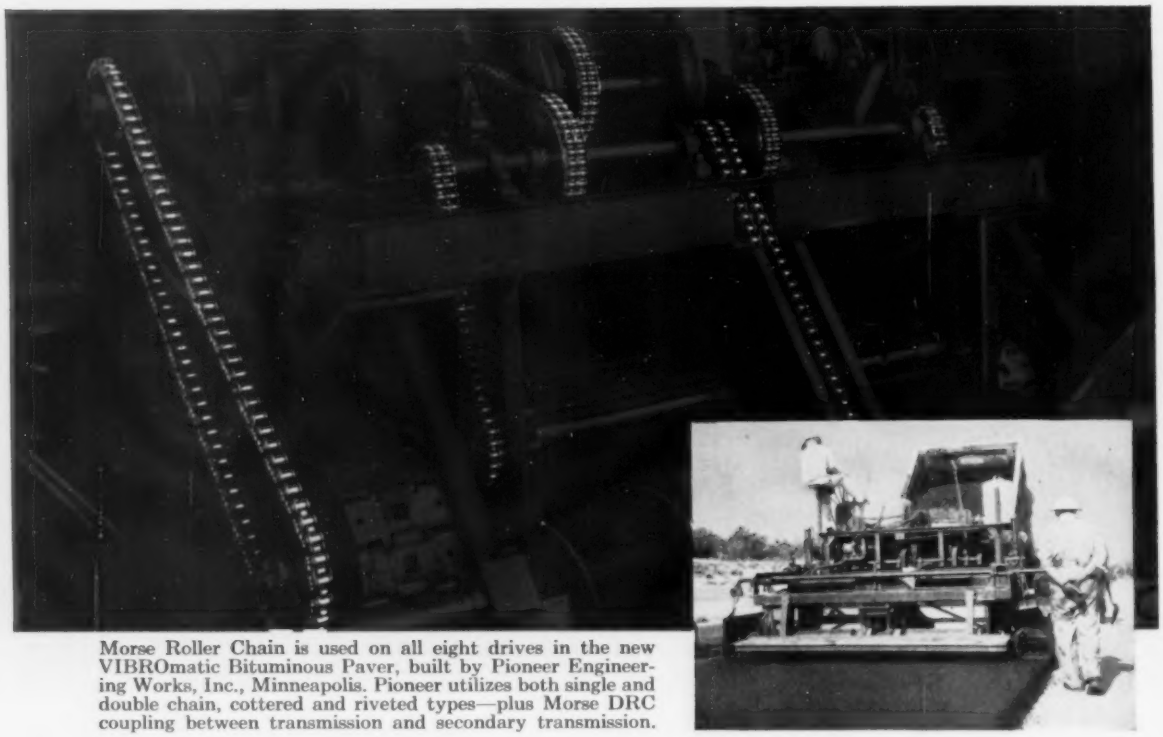
DIVISIONS OF HKP H. K. PORTER COMPANY, INC.

**H. K. PORTER COMPANY, INC.**

**QUAKER RUBBER DIVISION**
**Philadelphia 24, Pa.**

**QUAKER PIONEER RUBBER DIVISION**
**San Francisco 7, California**

# New Paver relies on Morse Chain to cut repairs and service costs



Morse Roller Chain is used on all eight drives in the new VIBROmatic Bituminous Paver, built by Pioneer Engineering Works, Inc., Minneapolis. Pioneer utilizes both single and double chain, cottered and riveted types—plus Morse DRC coupling between transmission and secondary transmission.

## Morse Chain and Couplings on Pioneer Bituminous Paver withstand the most punishing conditions, reduce maintenance costs

The problem of breakdowns and repairs—costly items for any user of power transmission equipment—has been minimized on the new Pioneer VIBROmatic Bituminous Paver. Pioneer engineers simplified their design, then selected Morse Roller Chain Drives as the most rugged and reliable drives available.

Pioneer thoroughly field-tested two pilot models of the paver under the most punishing conditions—and found Morse Roller Chain and Roller Chain Couplings required absolutely no maintenance or service costs.

The same high quality and precision workmanship that have made Morse equipment standard on this new paver, can cut repair bills and maintenance costs on many other types of equipment, as well.

**Free consultation information**

The next time you are faced with power transmission problems—have a talk with a Morse Engineer or your local Morse Distributor. They'll demonstrate how the complete line of Morse precision-built power transmission products can start cutting maintenance costs for you. Or, write today for information from the factory on your specific problem.

MORSE CHAIN CO.,
A BORG-WARNER INDUSTRY,
ITHACA, NEW YORK

**MORSE** BW *trademark POWER TRANSMISSION PRODUCTS

The MATERIAL HANDLING INSTITUTE'S EXPOSITION
Cleveland, Ohio
PUBLIC AUDITORIUM
JUNE 5th THRU 8th, 1956
BOOTH 1201

# Operation Deepfreeze sleds plow across Antarctica on tough skis of USS "T-1" Steel

**IGY IS THE REASON.** Scientists with the current Navy expedition to Antarctica will obtain scientific data on weather, atmospheric conditions, aurora and air glow, glaciers, geomagnetism, and allied subjects during the next International Geophysical Year (1957 and 1958). Tractor-drawn trains of cargo sleds, built by Otaco, Limited, Orillia, Ontario, Canada, will be used to haul supplies. Skis for the sleds are made of USS "T-1" Steel.

**THE SKIS ARE MADE OF USS "T-1" STEEL.** When the going gets rough, the runners on these cargo sleds are assembled into skis, 13 feet long and 34 inches wide, made of USS "T-1" Steel.

DURING OPERATION DEEPFREEZE, the Navy's current expedition to Antarctica, thirty-eight rugged cargo sleds will be used to haul supplies 400 miles from Little America to Marie Byrd Land. The 11-ton sleds, each carrying a load up to 20 tons, ride on skis made from tough ¼" plates of USS "T-1" Steel. The sleds were designed jointly by the United States Navy and Otaco, Limited, Orillia, Ontario, Canada.

Naturally, the skis had to be made from a steel that stays tough and durable at temperatures far below zero. The steel also had to possess high strength (to keep down weight), and excellent resistance to abrasion (to withstand the 400-mile trip across rugged, ice-covered terrain). In addition, the steel had to have good forming characteristics and be easily weldable (to simplify fabrication).

One steel met all the requirements; that was USS "T-1" Steel. USS "T-1" Steel has a minimum yield strength of 90,000 psi . . . can be welded as easily as carbon steel, with the proper electrodes . . . has excellent resistance to abrasion and impact abuse . . . and remains tough at low temperatures. It was ideal for this tough job.

## A VERSATILE NEW ALLOY STEEL

USS "T-1" Steel is adding strength and durability, cutting weight and costs, in steel mill equipment, power shovels, mine cars, bridges, coal handling equipment, pressure vessels, and many other applications, at high and at low temperatures. It probably can help you improve your own product. Write for complete information. United States Steel, Room 5352, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**USS "T-1" CONSTRUCTIONAL ALLOY STEEL**

USS

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

# stainless steels are thoroughbred, too

*The experienced exhibitor rents extra stalls... leaves them empty... to prevent contamination of his thoroughbred pets by canine neighbors.*

To develop their best qualities demands *exclusive* care. That is why Sun Ship's new Alloy Products Shop has been planned for the *exclusive* fabrication of stainless and alloy steel products. When you have selected from the many available Alloys a stainless steel best suited for your service condition, you have done only half the job. You must also provide for the best possible fabrication if you are to have full protection—"A Thoroughbred Job."

Why entrust stainless steel to be fabricated in the same shop where carbon steel products are fabricated, and subject this precious metal to contamination with iron fragments, dust, or other harmful elements? A segregated shop is your answer.

Sun Ship now operates an all-alloy shop, one especially built and equipped for fabricating stainless and alloy products as they should be—segregated from carbon steel fabrication.

We emphasize the fabrication of medium and heavy stainless, alloy and aluminum products for industry.

Try Sun Ship for stainless fabrication as it should be done.

Our Sales Engineering Department will be pleased to assist you with any of your fabrication problems.

*Sun Ship also makes all types of carbon steel pressure vessels.*

**ALLOY PRODUCTS SHOP**

**OF Sun SHIPBUILDING & DRY DOCK COMPANY**

ON THE DELAWARE • **CHESTER, PA.**

## Where the blur of the bite means a golden display

PHOTOGRAPHED AT DETREX CORP., DETROIT, MICH.

The shower of sparks tells you right away this wheel cuts faster! But that's only *one* feature of the revolutionary new B7 Bond Resinoid Cut-Off Wheel developed by CARBORUNDUM. *Want a faster cut, free from burr and burn?* B7, tested against ordinary wheels, gives it to you...with equal wheel life. *Want up to 25% longer wheel life?* B7 gives it to you...with equal quality of finish. No wonder B7 Bond Wheels are setting new standards of performance for abrasive cut-off... in production, close tolerance accuracy, economy! Have your CARBORUNDUM Distributor or salesman put a B7 blade on your chopper type machine, and see for yourself! For Bulletin A-1374 on B7 Bond Wheels, write The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ontario.

**Through application "know-how" and product quality**

# CARBORUNDUM

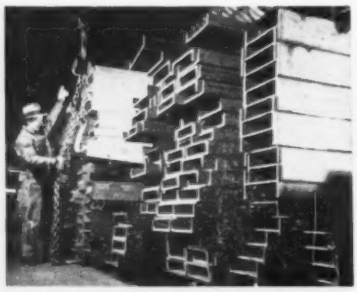
REGISTERED TRADE MARK

**continually puts more sense in your abrasive dollar**

# STEEL BUYERS GUIDE to Ryerson Products and Services

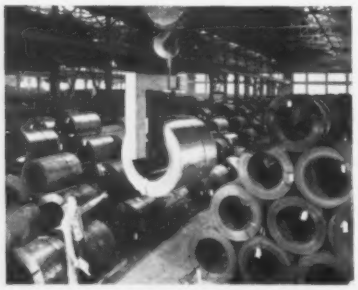
You can draw on your nearby Ryerson plant for an almost endless number of products and services—and the more you concentrate your purchases at one source, the more you save. Ryerson products not pictured here include: Re-bars, expanded metal, grating, plastic pipe, machinery and tools, etc. See your Ryerson catalog for complete list and write for descriptive literature.

**BARS**—The most complete range of types, shapes and sizes as well as the largest tonnage.



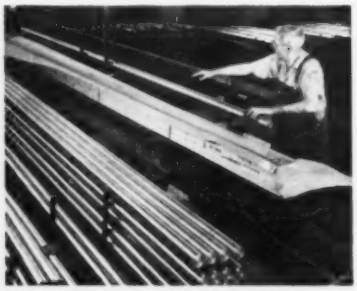
**STRUCTURALS** — I-beams, H-beams, channels, angles, tees and zees—all to ASTM spec. A-7.

**PLATES**—14 types including special low carbon plates for forming and welding, leaded New E-Z-Cut, etc.

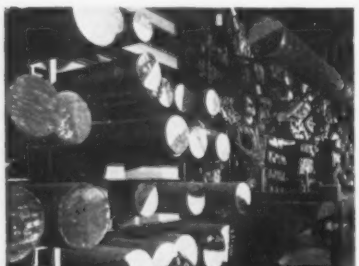


**SHEETS & STRIP**—More than 20 different types in pattern sizes, cut-to-order sizes, strip coils, etc.

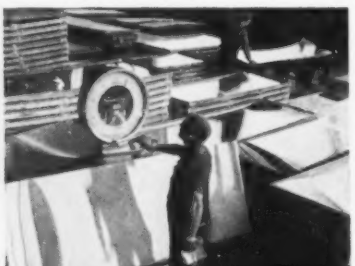
**TUBING**—Seamless and welded mechanical tubing, fluid power tubing, structural and boiler tubes, etc.



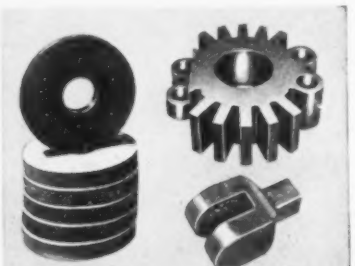
**C. F. BARS**—Cold finished steel for every use: screw steel, Ledloy, accuracy stock, machinery steel, shafting, etc.



**ALLOYS**—Every type including leaded alloys for fastest machining, all performance-proved by tests.



**STAINLESS**—Allegheny stainless in over 2,221 sizes, shapes, types, finishes: sheets, plates, bars, pipe, etc.



**FLAME CUTTING**—Almost any shape quickly cut from strong rolled steel—one or hundreds all alike.

## RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

# NEWSFRONT

### Wanted: Automation Specialists

Besides initial cost, relative inflexibility of equipment, there's another serious stumbling block to more widespread automation—shortage of necessary specialists. Users have trouble finding enough electronic, hydraulic men to maintain automated lines at top efficiency; enough trained tool and diemakers to produce the complex jigs and fixtures required. Thus far, efforts to train specialists represent only small step in right direction.

### Better Bonding Technique

Room temperature adhesive bonds stronger than corresponding soldered or possibly some brazed joints. That's the result claimed for an improved joining technique developed by an Eastern research firm. Same technique shows promise for high-strength, non-metallic bonding between metals at 1000°F and up. Immediate production joining applications include titanium, magnesium, aluminum and stainless.

### Tool Contracts Ready to Go

Commerce Dept.'s Business & Defense Services Administration expects to start signing contracts for machine tool orders in two or three weeks. BDSA is now working on uniform provisions of the contracts which will trigger defense machine tool orders automatically in case of an emergency.

### Aluminum Plans Big Pitch

Aluminum producers are planning an all-out advertising pitch to reach the final consumer of aluminum products. Four largest aluminum suppliers are all committed for fall TV programs, extensive campaigns in general media. Objective: to put strong primary push behind individual manufacturer, retailer selling efforts by building up stronger consumer demand for aluminum-fabricated products.

### No Slump in Steel Demand

Don't look for any sharp drop in the next six weeks in orders for summer steel. According to one steelmaker, these can reflect strike hedging almost as much as orders for delivery before July 1. Thinking is that steel users want to get on the books just in case, so they'll be first in line for delivery after possible strike is over.

### Simplified Equipment Analysis?

Experts on equipment replacement analysis are working hard on formula simplification plans. They've seen too many sound policies either bog down or go on the ash heap altogether because they were too complex for the average man to understand. Result is, you can look for some handy pocket rules or tables to turn up, help take the drudgery out of this important management responsibility.

### Another Step Toward Miniaturization

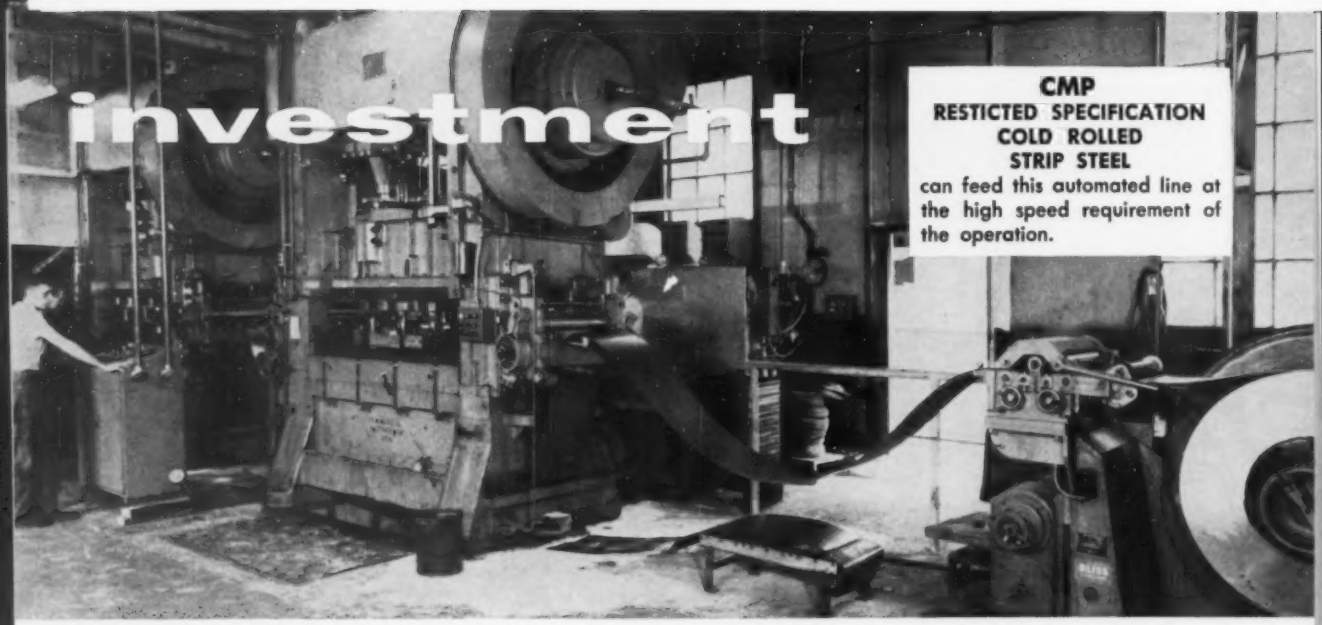
Negotiations are now in progress between a major picture equipment manufacturer and a small components specialist for design and mass production of a miniature motion picture camera. It's intended for the popular trade rather than professional consumption.

### New Metal for Spotless Output

A self-lubricating metal, still being developed, promises to eliminate oil and grease spotting of textile, paper and wood products. The metal is a powder metallurgy product consisting of fine metal particles and graphite. One of its chief uses will be for parts on processing equipment handling materials which cannot tolerate lubricants. Compacts are dense and machinable, and retain their lubricating properties indefinitely.

### It Depends on How You Look at It

Among recent developments in the finishing field is a paint that gives the effect of changing color. Automobile manufacturers are trying it out on new models. The color effect is achieved by metallic particles in the plastic base. As the viewing angle changes, so does the color effect.




Costly new equipment is not always the sole answer to production cost problems. Often the wrong raw material may completely nullify expected savings from heavy capital investments in modern machinery.

Consider the case of one manufacturer who installed expensive new forming equipment but was unable to up production to the expected level. Material being formed was cold rolled strip 4" x .060", AISI 1050 steel processed to standard gauge tolerances (.0567" to .0632").

When **CMP** Precision Cold Rolled Strip Steel ordered to a 60% gauge restriction (.0587" to .0613") was furnished, production immediately moved up to the rated capacity of the machines and has remained there.

In addition to increased production, because of the minimization of down time, an incidental and important benefit was the increase in yield per **CMP** ton processed because rejections and out of tolerance parts were eliminated.

Careful consideration of **CMP** Restricted Specification Cold Rolled Strip Steel alternatives on the same careful basis given to your equipment investment, may point the way to similar, or larger pay-offs.

Why not check the possibilities today?

**CMP**
**WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS**

LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

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**THE COLD METAL PRODUCTS CO.**
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**PLANTS:** YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
**SALES OFFICES:** NEW YORK CLEVELAND DETROIT INDIANAPOLIS CHICAGO LOS ANGELES SAN FRANCISCO

# All Isn't Joy as SUB Payments Start

**Mutterings in UAW grow as June 1 approaches . . . Only workers laid off since May 2 are eligible . . . Payments less than expected because funds only partly built up . . . But principle is established—*By T. L. Carry.***

◆ EVEN BEFORE the first supplemental unemployment benefit is paid in the auto industry, controversy is growing over whether Walter Reuther and the United Automobile Workers got what they thought they did in the history-making settlement a year ago.

Since last June, the auto industry has been building up a vast reserve fund at the rate of 5¢ per hour worked by each auto worker. First payments will start shortly after June 1, when the plan goes into effect.

The plan will get an immediate test of its merits or demerits. The number of unemployed in the auto industry has grown sharply in recent months and some 20,000 will be in line to draw their first supplemental unemployment pay as soon as the first work week in June is completed.

### Obvious Loopholes

On the surface, Mr. Reuther and his lieutenants should be receiving congratulations for their foresight. But loopholes in the plan are already appearing. Before the 3-year contracts are up, wholesale revisions will be planned for the next big negotiation of the UAW and auto industry.

Objections center around two factors: 1. The comparatively small amounts that will be received in supplemental pay by laid off workers. 2. The fact that skilled workers and those of high seniority would rather be taking the 5¢ per hour in their paychecks rather than insurance against a layoff that may never come.

Since the history-making settlement, the auto companies have been building up their reserve funds. The maximum, the point where the fund is considered built up, varies according to the number of workers. Ceiling for General Motors is $150 million; Ford, $55 million; and Chrysler $49 million.

### Reserve Fund Status

It is estimated that GM's fund is at about $49 million, Chrysler's at $9 million, and Ford's at approximately $14 million. Thus, all of the Big Three are between 22 and 30 pct of the maximum.

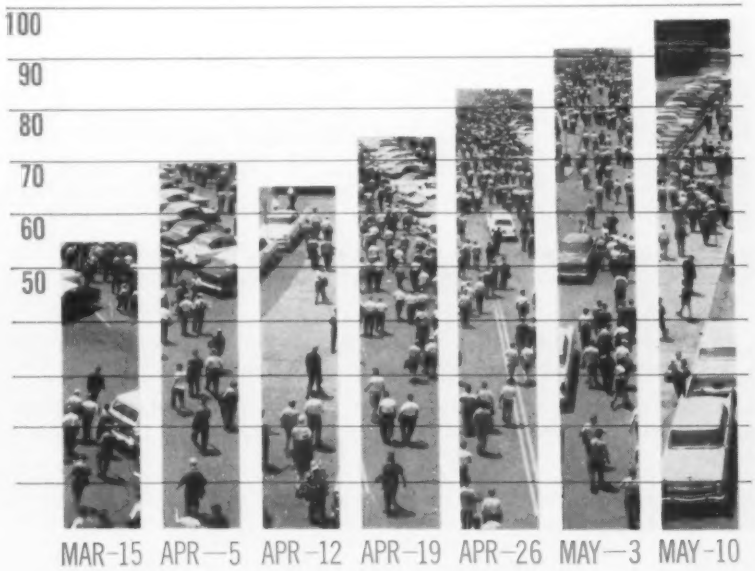
Workers build up credit units in order to collect payments from these funds if laid off during production letdowns. A man with from one to 10 years seniority accrues credit points at the rate of .25 points for every 32-hour work week since June 1, 1955. A worker with over 10 years seniority gets .5 points.

A worker with 1 to 10 years seniority who has worked every week the past year has 13 points to his credit.

When a laid off worker applies for an SUB payment, he uses up these points according to his sen-

## Climbing Auto Layoffs Test SUB

Michigan Automotive Unemployed—in thousands




Source: Michigan Employment Security Commission

iority and the amount of money in the company fund at the time. The actual amount of money he can collect also depends on how much he gets in state unemployment benefits.

### Hypothetical Case

Specifically, the SUB payment is the difference between his unemployment compensation and 65 pct of his take home pay for 4 weeks and 60 pct for another 22 weeks.

Taking a hypothetical case, a man with from one to 10 years seniority is laid off. He has a wife and two children and his average gross weekly pay is $92. Deduction for Social Security and income tax (only deductions considered) cut his actual pay to $82.66.

Sixty-five pct of that figure is $53.73. If the man lives in Michigan, his state unemployment benefit is $47 per week, a relatively high rate.

With the present position of the funds between 22 and 30 pct, if the man has from 1 to 5 years seniority, he will use up his credits at the rate of 3.33 points per week. If his seniority is between 5 and 10 years, his credits will decrease at the rate of 2.5 points per week.

Thus, this particular worker can collect $6.73 from the company over his state compensation for a period of either 3 or 4 weeks, depending on how long his points hold out. If he has between 5 and 10 years, he can collect $6.73 from the fund for 4 weeks and $2.60 for one week after the rate drops to 60 pct. In any case, if the amount of money the man has coming drops below $2 per week, he gets nothing.

The UAW's own publication, "The United Automobile Worker," uses a hypothetical case of a worker whose weekly pay is $72, after taxes, who receives an estimated $33 from state compensation when laid off. He will be eligible for benefits of $13.

### What UAW Says

The publication states: "The number of weeks for which the employee will receive Supplemental Unemployment Benefits is determined principally by his seniority and amount in the trust fund."

There is another technicality in the agreement that may cause more than a little trouble. Unless a worker had been laid off since May 2, he can't collect from the SUB fund. Since auto layoffs began to take serious proportions in March, there will be thousands of laid off workers who will be unable to collect because of the date deadline.

This, in turn, has led to charges that the auto industry intentionally laid off workers prematurely, in order to avoid the SUB payments. But this is scarcely a serious charge, because the auto industry will make all the cars it can sell without being concerned over the maximum 5¢ per hour it could cost later on.

### 20,000 Will Collect

It is not known exactly how many workers will be able to collect benefits, but it has been estimated that the figure is around 20,000. If the average benefit paid is $6.73 for a period of 4 weeks, the total cost of the plan to the Big Three will be slightly more than $550,000.

Whether Mr. Reuther was "taken" on the SUB depends on how you look at it. More than likely, the militant UAW leader knew what he was getting into. But it's unlikely that he foresaw the huge number of layoffs that were coming up early this year while the fund is still low.

At that time, he was more concerned with establishing a principle. In this respect, he accomplished what he set out to do. You can bet that in future bargaining sessions the amounts will be increased or lengthened, other inequities ironed out.

But the issue now is whether that will salve the feelings of the relatively few laid off workers who will receive little more than a pittance in SUB compensation.

They may be more apt to think along the same lines as the rebellious skilled workers within the UAW who maintained from the first that a bird in the hand is worth two in the bush.

In other words, maybe the extra 5¢ per hour now going into the SUB fund would be more desirable in the paycheck than in the fund where he may never see it.

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## What Happens When a Laid Off Auto Worker Meets SUB?

**Hypothetical father of two with a year seniority took home $82.66 before layoff. Michigan unemployment compensation will total about $47 a week.**

**SUB will pay up to 65 pct of take-home pay for four weeks, up to 60 pct for rest of maximum 26 weeks provided in contract.**

**But funds are less than 30 pct built up, so credit points dissipate accordingly, at rate of 3.33 per week for man with 1 to 5 years seniority.**

**So worker draws $6.73 for four weeks, $2.60 for roughly one more before his 13 points are used up.**

**Provided—He was laid off since May 2. If his layoff occurred before then, he is out of luck.**

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# STEEL: Union Price Tag Is High

**Steel labor is setting its cap for a whopping settlement . . . But unless its demands are pared, there will be trouble . . . Critical issues include premium weekend pay and other fringes—By J. B. Delaney.**

◆ NO MATTER how you look at it, steel labor is going after a whopping "package" from steel companies this year. Union leaders feel they have everything on their side—and they're hoping to make the most of it.

But when the smoke clears, union demands will have been slimmed down considerably. Either that, or there will be a strike. And the union has no more relish for a walkout than the steel companies.

David J. McDonald, president of the United Steel Workers, and other union leaders have laid down a series of demands ranging from supplementary unemployment benefits to premium pay for weekend work, along with the usual objective of a "substantial" wage hike. It also wants producers to shoulder the entire burden of health and insurance benefits.

It looks like this year's negotiations will be tough from the beginning. While steel company earnings look good, the producers are not apologizing for it and argue that profits should be even higher if they are going to finance necessary expansion in the years ahead.

### Peace Or War

Roger M. Blough, chairman of U. S. Steel Corp., has not been reticent about criticizing round-after-round of wage boosts and increased fringe benefit costs, which he says contribute to inflation. His views will be reflected at the bargaining table when the union and U. S. Steel sit down in Pittsburgh May 28 when negotiations get under way.

Most observers feel that the matter of peace or war hinges on how serious Mr. McDonald is about some of the union's announced objectives, particularly that of premium pay for weekend work. It's hard to tell. He said recently the union is "serious" about the weekend bonus, but in an earlier talk to a group of union members he said merely that this is the "break-through" year on this demand. That could mean almost anything.

When the chips are down, Mr. McDonald may reveal his real intentions by using the premium pay issue for bargaining purposes—either to wangle some extra pennies from the steel companies on wages or to achieve the other important objective of non-contributory health and insurance benefits.

Steel union leaders know that bonus pay for Saturday and Sunday work in the mills would cost steel companies a pretty penny. They argue that some steel estimates of 25-30¢ an hour are too high, but at the same time admit they have no idea of what the actual cost would be.

Mr. McDonald has emphasized that steel workers don't care about collecting weekend premium pay. He says the workers would rather have Saturday and Sunday off and let the mills keep their money. But steel management people say this is just union propaganda.

Position of steel companies probably will be more defensive on supplementary unemployment benefits than on some of the other issues. McDonald can point to his agreements with the can companies and to similar plans in other industries, particularly automotive. But this may not be as cut-and-dried as some people think. Steel producers may use this to offset other demands.

Whatever comes out of the steel settlement will set a pattern for other industries to follow. And executives in these other fields know it. At an American Management Association collective bargaining conference recently, conferees were particularly concerned over the union's objective of a non-contributory health and insurance program.

## What Steel Labor Wants

**▪ Here's the package that the United Steel Workers will lay on the bargaining table when it begins negotiations with major steel producers on May 28:**

**▪ Wages: A "substantial" pay boost.**

**▪ Weekend Premium Pay: ". . . the time is overdue for the institution of premium pay for all work performed on Saturday and Sunday as such."**

**▪ Supplementary Unemployment Benefits: ". . . The plan shall provide eligible employees up to 52 weeks of adequate benefits against the ravages of unemployment and shall encourage stabilization of employment."**

**▪ Insurance: ". . . enlarged and improved to provide . . . benefits for members . . . and their families on a benefit basis at employer expense."**

**▪ Union Shop: "The time is overdue . . ."**

**▪ Holidays and Vacations: Additional holidays and premium pay for those who work holidays.**

**▪ Miscellaneous: "Better" contract terms on shift premiums, hours of work, overtime, severance pay, incentives, reporting allowance, seniority, perferential hiring, etc.**

# APPLIANCES: Records, Not Obituaries

**Sad talk about appliances just doesn't stand up . . . Inventories are not excessive when evaluated against seasonal factors . . . Producers are worried about pessimism, predict record year—*By K. W. Bennett.***

◆ GRAVEDIGGING for the appliance manufacturer in 1956 is still premature. Despite reports of manufacturing cutbacks in appliance production, it can't be said yet that if you sell steel or components to an appliance manufacturer, you're in for a severe cut in business.

**At the dealer level** . . . Inventories of appliances are in oversupply but the cases are spotty. For instance, one major producer admits to temporary but minor adjustments at the distributor level. A competitor of larger size is still rebuilding inventory and will continue to until July.

Another completed rebuilding inventory at the distributor level two weeks ago and is not announcing any proposed cutback plans. One point is glaringly apparent among all three. While they've reduced their total sales estimate for the year, all three count on beating the heavy factory selling of last year, which was an all time record.

**At the factory level** . . . A major producer will take his full third quarter quota of steel, including cold-rolled sheet. Like most, he is booked only through July and is playing his cards close to his chest, but current planning calls for absorption of his full mill quota of steel. A small producer is booking his full third quarter tonnage. He's heavy on inventory at the moment, but fears the advent of automotive buying.

WITH big consumer buying season of June-July just ahead, refrigerator manufacturers are worried about inadequate output rather than over-supply. New models are rolling off the line at Norge plant, Muskegon, Mich.

A third producer with a normal inventory (45-60 days) of steel on hand is ordering only through July but plans to take his full third quarter tonnage. A fourth, smaller supplier, has reduced third quarter steel intake by one-third but plans to hit a stronger pace in his first quarter buying. All agree that mills no longer mention quota with reference to third quarter cold-rolled sheet. All agree that it is easy to get and that additional tonnages could be obtained for quick delivery from the mills.

### The Other Fellow

Everyone reports that he hears his competitor is piling up inventory. All say that it is not true in their own case, save in scattered instances. One producer, for instance, is 15 pct off in sales. But he is off 15 pct from his original sales estimate. In actual selling, he's still ahead of last year, a record year for this firm, and figures to be in the same shape at the close of the 1956 selling season.

Why the optimism in the face of scattered reports to the contrary? For one thing, where appliance inventories have accumulated at the dealer level, they are heavily weighted to refrigerators. The normal consumer buying season is still ahead, runs from June through July. Same for freezers. Despite the fact that home laundry equipment (amounting to about one-third of total appliance sales) enjoyed a record first quarter (1,647,176 units this year as compared with 1,443,858 units last year, up 14 pct), this substantial portion of the appliance market still has its best traditional months ahead of it. In seven years

out of nine for which monthly sales statistics are available, the September-November period marks the period of strongest sales. Ranges are less seasonal, are fairly level through the year. Room air conditioners aren't scheduled for heavy consumer attention until June. With the selling season still ahead, early forecasts for air conditioners indicate a 1.5 million unit year as compared with 1.29 million units last year, and this after some unseasonally strong sales in first quarter of this year.

Are appliance builders whistling in the dark? Perhaps, but the higher percentage of those contacted were convinced they'd beat '55 sales in '56, were glad to see cold rolled sheet in free supply at the moment, but weren't prepared to reduce third quarter buying quotas yet, even though orders are placed only through the month of July.

Main alarm in the industry is the frequent reports in the press of slowdowns in automotive, farm equipment, and now the appliance industry. Said one sales chief, "The public, and that includes our own dealers and distributors, could be talked into a 'no buy' frame of mind if they keep hearing that things are bad. At the moment, that's bothering us more than our own sales levels."

Bearish stories about appliances are traditional. It's a hotly competitive industry and it has overproduced from time to time on specific appliances — for example the glut of room air conditioning units in 1954.

But for most products, the figures show steady growth in sales over recent years. On refrigerators and TV sets, the gross last year was over $1 billion for each.

Unit sales of automatic washers, for example, have shown steady increases since 1948 when unit sales were 950,000 compared with 3,187,000 in 1955. Refrigerators, which were in much more general use, actually declined from the postwar peak of 6,200,000 sales in 1950 to around 3,500,000 in the years 1952-1954. But last year over 4 million were sold.

MARKETING

# TELEVISION: Hopeful Slump

**Industry isn't worried about drop in sales . . . Calls it readjustment period prior to era of color . . . Seasonal elements, improved technology are factors.**

◆ IS THE BLOOM off television sales? Despite a slump in first quarter sales of sets against the same period last year, the industry is not frightened, sees great things ahead. But it admits there are worries.

Set production in the first quarter of this year was 1,844,635 and unit sales reached 1,689,178. This is a significant slump when compared to first quarter '55 production 2,188,252 sets and unit sales of 1,943,992, according to figures of Radio Electronics Television Manufacturers Assn.

At the same time, inventories have continued to build up until stocks on hand in all channels—manufacturers, distributors and retailers—are now estimated to be over 30 pct of the 7.3 million sets the industry expects to sell this year. About 70 pct of all American homes now have one or more TV sets—a situation which some observers consider near the saturation point since there are still fringe reception areas.

### Seasonal Cutback

Overall, however, the industry feels it still has new worlds to conquer. Manufacturers point out that television is barely 10 years old as a full-fledged industry, and that some shakeout was inevitable once the initial boom was over. Price cuts are in part due to increasing competition, but producers point out that mass production techniques, printed circuits, transistors and other electronic advances have made very substantial contributions to lower costs.

Inventory buildup during the winter and spring is a normal part of the business. Production is cut during the summer against new model introductions in the fall, and outdoor living, daylight saving time and other seasonal factors cut into viewing time and, hence, demand. One large company reported inventories of its sets were almost exactly where they were at this time in 1954, one of the best years in the industry's life.

### Portables Popular

Projected saturation points can be tricky, as the radio industry learned recently. TV producers point out that more and more areas are getting better TV coverage, and local programs and facilities are growing nicely. And the 70 pct figure is cumulative, does not reveal the potential customers (believed to be numerous) for newer, larger screen sets.

And the new portable sets appear to have opened up major new sales areas. General Electric reports the reaction to its line of portables as "fabulous," credits it with keeping GE sales at peak levels, counter to the industry trend. Philco expects TV unit sales this year to equal 1955, is banking heavily on portable models. (But it admits dollar volume might be lower.)

### Color Costs High

White hope of the industry is color. Industry spokesmen at the close of last year were trumpeting that '56 would be the year of the big breakthrough in color TV. Color set sales were predicted at around 250,000 this year. So far the breakthrough has been a letdown. The public has shown that it can take color or leave it alone. And so far they are leaving it. High set price (about $750) is only one of the reasons.

POWER

# NUCLEAR FUEL: Fabricating Goes Private

**Babcock & Wilcox open first private plant to fabricate nuclear fuel elements . . . Infant industry has major metalworking potential in diverse areas . . . Experimental research is expensive work.**

◆ COMMERCIAL ATOMIC ENERGY moved a step closer to reality with opening of the nation's first nuclear fuel element fabricating plant built and financed entirely by private industry. The new plant was opened at Lynchburg, Va., by Babcock & Wilcox Co.

Fuel element fabrication cuts across almost every area of metalworking. It is a key area where cost cuts can mean cheaper power. It requires vacuum melting, impact forging, rolling of clad metals, shearing, stamping, blast cleaning, pickling, brazing and welding, plus a complete precision machine shop.

### Expensive Testing

B & W also showed a new experimental unit where its commercial nuclear power plants will be tested in prototype until the infant industry learns more about reactor behavior. Here the company is erecting a model of the reactor for the 236,000-kw plant which it will build for Consolidated Edison near New York. In this field, prototype work is not cheap. The Con Ed prototype will have a core 6 ft high by 6 ft diam, the same size as the commercial unit. It will contain the same amount of uranium ($6 to $8 million worth) and thorium ($500,000 worth)—but will not be allowed to develop more than a few watts power. All uranium and thorium will be recovered for other uses.

B & W has found a number of ways to cut fuel element fabricating costs well below those now current at some other plants.

■ **Only about 20 pct of the cost of power delivered to a city dwelling today is represented by generating costs. To put atomic power in perspective, the reader should realize that even if it cut generating costs in half it would mean only a 10 pct cut in power bills.**

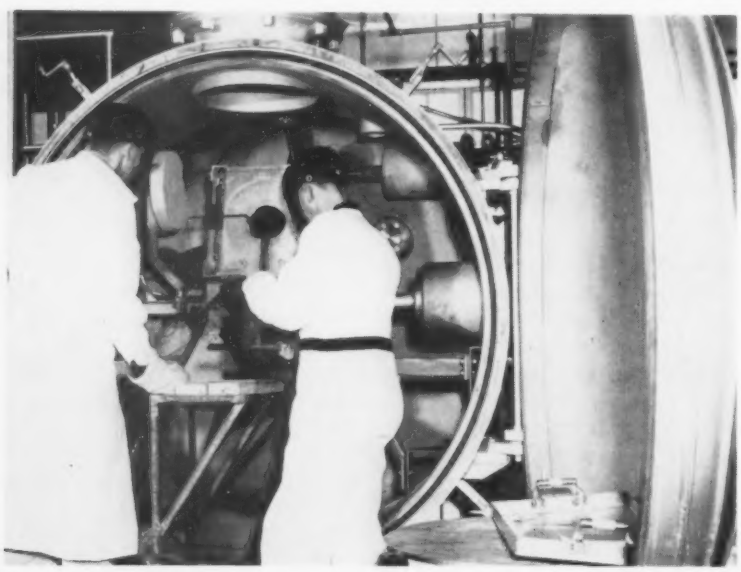
The fuel element which B & W is now producing is of the multiple plate type—which sounds a lot simpler than it is. One element being made for the Materials Testing Reactor, Arco, Ida., is about square by 2-ft long.

### Some Problems

Each of the interior plates is a sandwich with an interior core of 13 pct enriched uranium (U235)—aluminum alloy surrounded by 2S aluminum, for a total thickness of about 0.060 in. The tentative design for the Consolidated Edison reactor calls for similar construction of 6 in. square by 8 ft long, but with plates of uranium-zirconium "meat" in Zircaloy-2 cladding alternating with thorium "meat" in Zircaloy-2 cladding. These are surrounded by a Zircaloy-2 case.

Major metallurgical headache in the fuel making operation is securing a 100 pct bond between the core (uranium and zirconium) and the outer cladding material. Apparently it helps if both core and cladding contain a common element in their alloys. Even with this, it means checking by fluoroscope, X-ray and ultrasonic inspection.

This is the first use of thorium in a commercial reactor. Its use has long been discussed on the theory that fission of U235 would convert thorium to U233 as the U235 is used up. If the conversion rate is faster than the burn-up rate, the reactor would be a breeder reactor.



INDUCTION melting furnace at Nuclear Facilities Plant, Babcock & Wilcox Co. is used to produce alloys used in fuel element fabrication. Design of the equipment permits melting in air, vacuum or atmosphere.

# CAMPUS RECRUITING: The Stampede Is On

**Competition for college graduates who are management material keener than ever . . . Lures more attractive, include higher starting salary and advance study scholarships—By *R. O. Schulin.***

◆ METALWORKING companies will have to hunt harder, look longer and make lures more attractive if they are to get their share of this June's crop of college graduates.

A few firms have begun hiring High School science graduates paying 75 pct of their tuition through an 8-year night school engineering course.

The National Industrial Conference Board's study of recruiting practices by 240 manufacturing and non-manufacturing firms shows that major changes have taken place since 1948. Many firms report close ties with more schools on a systematic, year-round basis.

The Big Ten, Ivy League and engineering colleges are the most popular recruiting grounds. But interest in the smaller liberal arts colleges has been growing. The average company that goes in for college recruiting now sends representatives to 41 colleges and universities, and solicits about a dozen more by mail or telephone, the survey shows.

### Well Organized

A number of organized campaigns feature appointing personnel specialists to make regular college visits; increasing salary offerings sharply; developing summer employment and work-study plans; preparing descriptive booklets to sell seniors on their firm; expanding training programs.

Budd Co., manufacturer of auto and truck bodies and stainless steel railroad cars, has gone to great lengths to develop a college recruiting program. The company has a quota of nine cadet trainees a year, but begins lining up campus interviews a year ahead of time, assuring itself of contacting a substantial share of graduates.

### One Company

"We've gotten away from the idea that engineering graduates make the best management material," said L. F. Randall, personnel manager. "We hire the man, not the degree."

Careful screening is one of the most important factors, Mr. Randall believes. Two company recruiters visit 29 selected campuses in the East and Midwest in the course of a year. Correspondence is carried on with another 40 or 50. Since 1946 more than 4,000 candidates have been interviewed, but only 66 were hired.

Although April and May still are the big months for recruiting, only one company in four believes the job can be done in this period. Nearly 26 pct of reporting firms recruit seven months of the year or longer, and more than 10 pct seek talent around the calendar.

The 1955 quotas of 235 companies of all types totaled nearly 19,000 recruits, or an average of 80 recruits per company. About half the demand was for engineers; 20 pct for sales; and 11 pct for general business trainees.

### Sellers Market

Lining up good prospects before the recruiters arrive on campus is a practice that is growing in popularity. College placement officers may be asked to select likely seniors.

Most executives regarded the average 1955 starting salary of $350 a month for trainees as "too high," but they predicted that the figure would go higher in the future. For the students it is a seller's market.

## GRADUATES: Who Wants Them?

■ Just about everybody, it seems. Companies are vieing with each other, not only for profits, but for acquisition of promising young men who are executive material.

■ Recruitment of college grads has become a science in the past 10 years. Objectives of the modern executive training program are well-defined. Alert personnel managers are:

1) making closer ties with more colleges.
2) hiring full time campus recruiting specialists.
3) arranging interviews a year in advance.
4) bombarding seniors with company literature.
5) upping salary offers.
6) expanding training programs.
7) offering summer employment and work-study plans.

■ The companies who get there first with the best offer will have their pick of the nation's top 20,000 June grads . . . June of 1957, that is. This year's crop is just about gone. Many smaller colleges are happy hunting grounds for prize students.

FUEL

# GAS: L-P Boom Pushes Tank Makers

**Liquefied petroleum market growth pressures tank fabricators . . . But steel plate shortage is a real problem . . . Distributors push trend to larger tanks . . . New gas sales record forecast for this year.**

◆ A STRONG contender for the limited amount of ¼-in. plate steel mills are rolling is still waiting in the wings. Sales of liquefied petroleum gas storage tanks are currently running about 10 to 20 pct ahead of last year.

The big buying season begins in June, and at that time it's probable that the 91 fabricators of L-P storage tanks and the round dozen of storage cylinder producers will begin to report increasing difficulty in supplying tanks for off-the-shelf delivery.

Behind this demand for light plate is the continuing boom in L-P gas sales. In 1953 the industry marketed 4.9 billion gal of butane and propane as a fuel for heating homes, operating home appliances, powering farm tractors, taxicabs, over-the-highway trucks, buses, weed burning, heating home soldering irons and other uses. In 1954, 5.1 billion gal of L-P gas went to market; in 1955 about 6 billion gal; and the projected figure for this year is 7.3 billion.

Tank capacity to store the growing ocean of fuel has moved upward, though at a more erratic pace. In 1953 about 249,099 propane-butane storage tanks were fabricated and shipped to bulk fuel distributors, as well as to consumers who store the fuel in their own backyard or farmyard. In 1954 tank installations fell to 209,728 units fabricated and shipped. In 1955, 261,577 tanks were built.

### Push Bigger Tanks

And L-P men say it's strongly probable that an absolute minimum of 289,043 tanks will be built this year, steel supply permitting. This does not include, of course, between 900,000 and 1,000,000 cylinders. Cylinder sales have held strongly, but do not seem destined to move up with the advances in tanks, which have more storage capacity permitting the dealer to cut down on the number of trips necessary to refill the tank per customer per year.

At present the most popular tank holds about 500 gal of liquefied petroleum gas, and this tank size by 1954 and 1955 represented about 40 pct of the total number of tanks built. In an effort to boost bulk handling of the fuel, a drive to boost home fuel tanks from 500 to 700-800 gal capacity is already underway, and where 1000 gal tanks are already in use, sellers will seek to convince the customer of the economy in boosting storage tank size to 1200-1400 gal capacity. Which, as the drive takes hold, means more steel per tank.

The L-P gas tank fabricating industry is approaching the June seasonal surge with a fair stock of 500 and 1000 gal tanks in reserve despite the sales advance already felt in the first quarter of this year. But orders for larger tanks of the industrial type, in the 6000 to 30,000 gal capacity range, are already going begging; some firms are quoting six months delivery and longer. And what is already true in the big tanks will be felt in smaller sizes as the season advances. Third quarter is the traditional strong selling season.

**LIQUEFIED PETROLEUM GAS SALES**

(Thousands of Gallons)

| | |
|---|---|
| 1945 | 1,067,979 |
| 1946 | 1,410,370 |
| 1947 | 2,008,262 |
| 1948 | 2,511,160 |
| 1949 | 2,658,749 |
| 1950 | 3,254,082 |
| 1951 | 4,100,000 |
| 1952 | 4,477,379 |
| 1953 | 4,932,009 |
| 1954 | 5,134,000 |
| 1955 | 6,000,000 |
| 1956* | 7,300,000 |

* Estimated.
Avg annual increase since 1945: 17.9 pct.

### Market Expanding

Who's in? There are at least 91 producers, but names most generally heard include Pressed Steel Tank; J. B. Beaird; Black, Sivalls & Bryson; Delta Tank; Master Tank & Welding; Scaife Co.; United Petroleum Gas; Butler Mfg. Co.; Trinity Steel; Cremer & Dunlap Co.; and Bagwell Steel Co., to mention a bare handful.

As a rough rule of thumb a 500 gal L-P tank would weigh in at about 1350 lb, a 1000 gal tank at 2650, according to one fabricator. They'll be getting bigger, but in 1955 at least 500 tanks rated at above 3000 gal capacity were shipped and at least 900 the year previous.

L-P is still expanding its markets. With just about every farm tractor manufacturer now producing at least some farm tractors built to run on L-P gas, Ford remains a major holdout but admits to at least a thorough study of the market. Outsiders insist that Ford has gone beyond the study stage, is at the pilot model stage and with the experience gained, could be pulled through the back door into L-P truck engine manufacture.

# DESIGNERS: Try to Cut Costs, Up Quality

**Metalworking alloys, finishes, forms, and fasteners get once over at first Design Engineering Show . . . Miniaturization of parts and pre-plating get attention . . . Better cost analyzing urged—*By P. J. Cathey.***

◆ GROWING CONCERN with the methods and the materials used by industrial design engineers was clearly indicated at the first Design Engineering Show, in Philadelphia's Convention Hall.

Hundreds of new products, many in the metalworking field, were critically examined by designers for possible incorporation in tomorrow's products. Emphasis among the exhibits from leading metal industry firms was on miniaturizing products to get more for less, on pre-plating metals for faster fabrication and on better, quicker methods of fastening.

Cost reductions in product design, procurement and training of engineers and the legal rights to inventions were among topics considered at a concurrent design conference sponsored by the American Society of Mechanical Engineers.

Striking examples of reducing product costs by as much as 80 pct were outlined at the conference by GE speakers discussing that firm's "value analysis" system. This method makes use of a specialist who analyzes every factor of cost in a product so it can be produced at the lowest possible price. Thus, responsibility for product cost is centralized in only one individual.

### Cut Costs 80 Pct

Evidence of the system's effectiveness was given with the example of a garbage disposal unit whose cost was cut from $135 to $85. Also mentioned was a cost reduction of 80 pct made possible in a fighter pilot's "joy stick" used in radar control to bring an enemy target into position. GE has announced plans to train 1500 employees in value analysis method.

Waste of the designer's time was condensed in another session of the conference.

"If the average production worker's time were as loosely scheduled and used as are many designers, both the company's manufacturing program and competitive position would be in rough shape," Prof. Chester Linsky, Pennsylvania State University, declared.

"Study after study shows that design engineers are being used for routine jobs which technicians or draftsmen could do," he added. Possible solution to the problem: insure that the promise of challenging and high level assignments advanced as employment lures to engineering graduates are actually fulfilled after they are employed.

### Miniaturization Stressed

Miniaturization of parts played a star role at the Standard Pressed Steel Co. booth where its importance was stressed for all products from small self-locking nut to giant cap screws. This manufacturer also featured an assembly bolt which can provide a reduction of 43 pct in the weight of fasteners used in airframes.

Uses not previously thought about were suggested for many of the products by the design engineers who viewed them. In some cases promising lines for future development were also advanced.

STITCHER FOR JOINING two pieces of dissimilar metal in about one-fifth of a second was exhibited by Acme Steel Co. at the first Design Engineering Show in Philadelphia's Convention Hall, May 14-17.

# HANDLING: Equipment Sales Booming

**Indications of $1.5 billion in sales for '56 . . . Commercial buyers took up slack after the military buildup for Korea brought drop . . . Trend now toward specialization—By G. J. McManus.**

◆ MATERIALS HANDLING equipment makers have a genuine boom going. Current sales point to a record $1.5 billion year for the industry. That will be a 10 pct hike over last year, $500 million more than in 1954.

And these figures represent solid, permanent growth. For example, shipments of conveyors advanced from $158 million in 1950 to $265 million in 1955, with current expectations of an increase of 5 to 10 pct this year over last. Shipments of electric trucks and tractors jumped from 234 units a month in '50 to 552 units in '55, while shipments of electric cranes this year are expected to better the previous high of $80 million chalked up in 1953.

In the past, materials handling leaned heavily on government sales. Military orders for forklift trucks ran about 15,000 units a year during the Korean buildup; cranes, conveyors and tractors were likewise bought in large chunks.

### Sales Jump

The sharp drop in government buying after 1953, coming on top of a general business lag, made 1954 a lean year for materials handling men. But last year commercial buyers began taking up the slack. Sales jumped from $1 billion to over $1.3 billion. The climb has continued this year, with bookings for the first quarter up well over 1955 and with March the best month for new orders in three years.

### Want Complex Units

All types for materials handling equipment share in the advance but the trend is toward more complex units, engineered for special jobs and equipped to take over more of the handling load. This has made for a severe engineering bottleneck for suppliers for big crane and conveyor systems.

Mathews Conveyor Co. has its engineers on a 55-hour week. Like other conveyor companies, Mathews is working closely with manufacturers of production equipment in the engineering of complete systems.

Even without the heavy engineering load, conveyor people would be hard pressed to keep up with demand. New orders for the first two months of this year have run 50 pct over last year's.

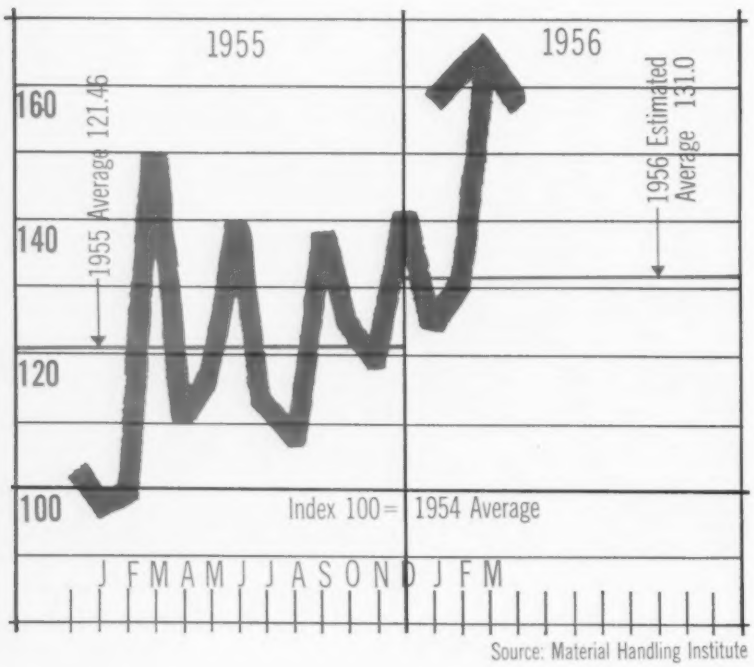
Situation is similar for builders of electric overhead cranes. Sales will probably jump $30 million this year. Bookings are way up. And cranes keep getting bigger and broader. They must be designed to meet special situations. Builders must find the engineers, the structural steel and the plates—all tight items.

### Deliveries Big Factor

These conditions have builders working at least two shifts and still not making much impression on deliveries that run 18 to 20 months for specialized types of cranes; 30 to 40 weeks for more standard types.

Sales of forklift trucks and tractors are running about 500 units a month for electric models, about 17,000 a month for gas powered. Standard industrial

## Booming Materials Handling Sales




Source: Material Handling Institute

trucks are being delivered from stock today. There are slight delays for large straddle trucks. Mobile cranes up to 20 tons can be delivered in 45 to 60 days; big 50-ton mobile cranes take about 8 to 9 months to get.

Trend in forklifts is toward shorter turning circles to conserve storage space; greater use of liquid propane gas for cleaner operation and less maintenance; and broader use of the trucks in the handling of unit loads. The Interstate Commerce Commission ruled last year that pallets or other unitizing devices could be shipped without charge as base for the payload. Brickyard men are among those who are taking advantage of the ruling and shipping products in units that can be handled mechanically.

■ **For a full-scale study on handling problems, see "How to Get More for Your Material Handling Dollar" beginning on page 149.**

Makers of hoists, monorails, hand trucks, and storage equipment report similar stories: Industry is looking for more equipment to do more handling jobs. Everyone is optimistic about the future. Heavy expansion plans in steel, nonferrous, automotive and other industries account for part of the cheer. More important than this probably is the general recognition that materials handling is an essential and costly part of production (25 pct of the average plant's cost).

## Containers Ordered

Special steel shipping containers that will be used in improving handling of military cargoes are to be built for the Army by Jeta Metal Fabricators, Inc., Yonkers, N. Y.

Jeta has a new contract for nearly $5.5 million to turn out 21,127 containers, each of them 8 ft long, 6 ft wide, and 7 ft tall. Known as "transporters," these units have come into increasing use in the Army during the past three years.

DEFENSE

# SCRAP: Export Battle Rages

**Steel executives charge export policies are not realistic, point to ore shortage . . . Government prepares new study of essentiality . . . Scrap industry fights back.**

◆ CONTROVERSY over U. S. scrap export policies continues to build up, with steel leaders and the scrap industry poles apart.

Meanwhile, the government is preparing to make a new study of the essentiality of the scrap industry. Its results could pave the way for some new government policies on stockpiling or exporting of scrap. The study is to be made by the Business and Defense Services Administration at the request of the Office of Defense Mobilization.

### What's Needed?

The study will estimate how much ferrous scrap will be needed to cope with (1) an emergency, (2) a limited war and (3) an all-out war. Study will also include copper and aluminum scrap.

"Dangerously shortsighted," is the way Ben Moreell, chairman of Jones & Laughlin Steel Corp., and E. T. Weir, chairman of National Steel Corp., characterize scrap export policies, in a joint letter to representatives and senators.

Labeling the continued large exportation "both dangerous and absurd," they point out that in 1956 it will be necessary to import about 25 million tons of iron ore. In 1955, about 5 million tons of scrap, equivalent to 9 million tons of ore, were exported.

### Cancel Out

"It certainly seems pointless," the letter states, "for steel companies to bring iron ore from foreign sources that have been explored, acquired and developed at enormous expense when incoming ore boats are being passed by shiploads of scrap on the way out."

At the same time, they are countered by Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel. He charges that steel officials who claim exports of iron and steel scrap are uncontrolled are not consistent.

"Actually, government export controls over this commodity are tighter than they are for finished products and pig iron which the steel mills themselves export. All the scrap industry wants is equal treatment for its products," he contends.

Mr. Barringer points out that scrap dealers and brokers are offering scrap and finding few takers. However, principal reason is that mills are attempting to force the high price of scrap to lower levels.

Mr. Weir and Admiral Moreell also refer to arguments that consumers' stocks are at a high level.

"Actually, all that this means from a practical standpoint is that there is a three months supply of scrap on hand. The all-important fact is that the U. S. simply cannot afford to diminish further its reserves of raw materials for production of iron and steel. Iron and steel scrap is a vital raw material and whatever amount of it leaves this country is a permanent loss which cannot be made up in any way."

In its investigation, the BDSA expects to call upon top executives of steel, copper, and aluminum companies, as well as the scrap industry, to get expert opinion on supply and demand.

The Administration still is opposed to any export controls, and there is no evidence that the position might be reversed. Feeling is that it is a price problem, not a supply problem, that the government should stay out of price matters when there is no price control program in effect.

# EXPANSION IN INDUSTRY

## Barium Loan

Barium Steel Corp. has received a loan of $5 million from General Electric Co. to enable Barium to liquidate back federal income and excess profit taxes, and to add to working capital.

Since Barium's indebtedness to the federal government was figured at about $4 million, the GE loan permits Barium to wipe out this debt and add about $1 million to its working capital. Loan is repayable to GE in 50 monthly installments at 4½ pct. In addition, GE gets first call on certain Barium steel products, principally plate and structural, for the next 5 years.

Under terms of the loan, Barium is permitted to pay cash dividends on stock out of earnings, provided such dividends do not exceed 35 pct of earnings and working capital is not reduced below $11 million.

Queried on future plans, J. J. Sisto, Barium board chairman, would not comment on dividend prospects or possible steel expansion, except to say that Barium is developing expansion plans.

## Anaconda:

### 5-year expansion project will cost $384 million

Anaconda Co. plans to spend more than $384 million for expansion and modernization during the next five years. Most of the capital required for the project will come from plant depreciation and retained earnings rather than long term financing.

No specific outline for expenditures has been made. But it is expected that similar sums will be spent to expand mining operations as well as build up capacity of refineries of both copper and aluminum in both Chile and the U. S.

Total expenditure of $384 million would exceed amount spent for similar projects over the past 10 years.

## Alcoa Anticipates

Aluminum Co. of America foresees the need to spend about $600 million in the next five years if it is to keep up with expanding markets.

While he revealed no definite plan, Alcoa president I. W. Wilson did insist that "Alcoa intends to strengthen its leading position in the industry in spite of competition."

Wide variety of existing uses, as well as good future possibilities is the basis for the Alcoa outlook.

On the recently advanced idea that supply would catch demand in 1956 and thus weaken the market, Mr. Wilson insisted that a meeting of supply and demand would simply make application of aluminum in new fields more readily possible.

## Steam Turbine Project

Over the next five years the General Electric Co.'s medium steam turbine, generator and gear dept. will be expanded and modernized at a cost of $23 million.

Plans call for construction of new buildings, acquisition of new equipment.

One new building will contain about 60,000 sq ft of factory space serviced by an overhead crane. Welding and fabricating operations will be supplied with new 84,000 sq ft area.

## Expansion Briefs

**Stanley Works**, New Britain, Conn.; new manufacturing plant to double capacity for steel strapping production.

**Champion Spark Plug Co.**, Toledo; expansion of the Cambridge, O., plant by about 20 pct; completion expected about Sept. 1.

**Chambersburg Engineering Co.**, Chambersburg, Pa.; new foundry for production of all types of castings; cost about $1 million.

**Leeds & Northrup Co.**, North Wales, Pa.; new instrument manufacturing plant.

**Page-Hershey Tubes Ltd.** and **The Steel Co. of Canada**; new $10 million jointly owned steel mill has contract to supply 150 miles of 20-in. steel pipe for Canadian oil pipe line.

**Vanadium Corp. of America**, New York; will construct new ferroalloys plant near New Alexandria, O.; designed primarily for production of ferrochromium alloys.

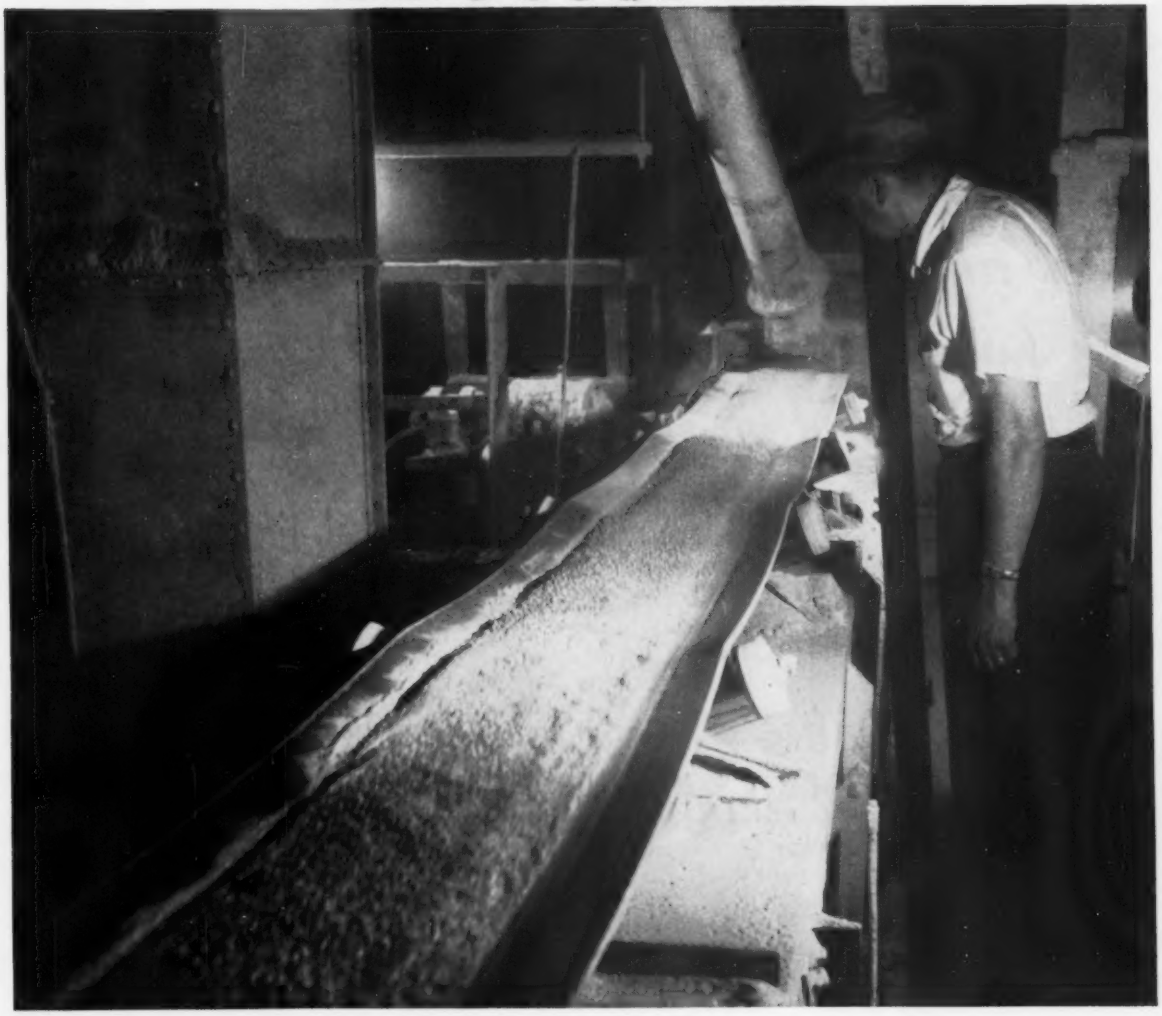
**Chesapeake & Ohio Railway**, Cleveland; expansion of fabricating shops at Raceland, Ky.; cost about $1.5 million.

**Truscon Steel Div.**, Republic Steel Corp., Youngstown; modernization program to double metal lath producing capacity.

**Hubbard & Co.**, Pittsburgh; construction of new pole line hardware plant in Plano, Tex.

**Pittsburgh Testing Laboratory**, Pittsburgh, will lease a new building at Tonawanda, N. Y. Cost, $150,000.

# B.F.Goodrich



## It used to burn up every 6 months

***A typical example of B. F. Goodrich improvement in rubber***

You could smell the belt burning, see the cracks in it. Limestone sand, to be used in making window glass, is heated to 300 degrees, then dumped onto a moving belt to be carried away from the furnace. But the sizzling heat burned out belts of almost every known make—they averaged only six months.

Then an engineer suggested a new, improved B. F. Goodrich hot-material belt, called Solarflex. It's made with a special kind of rubber that stays soft and pliable even at temperatures that cause other belts to harden and crack.

They fastened a length of the new B. F. Goodrich belting to the hot material belt you see here. The heat ruined the regular belt as usual—but not the Solarflex. It has now outlasted three standard hot-material belts, is still going strong after two years.

B. F. Goodrich conveyor belts invariably save money for users because they're engineered for the special jobs to be done. Some kinds of belts stand crashing blows, lasting far longer than others ever used to last. Some are made to handle wet, sticky or freezing materials without clogging pulleys. Some are made to carry packages and other things up very steep inclines. In fact, there's a B. F. Goodrich belt for almost every problem.

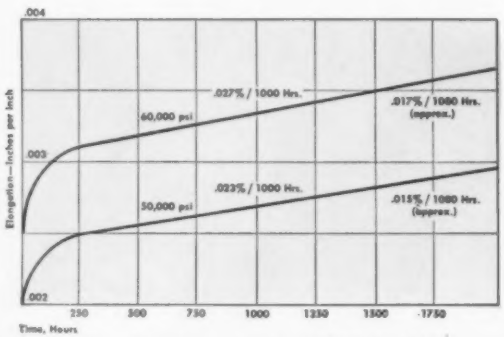
Call your B. F. Goodrich distributor for more information about any kind of belting, hose or other B. F. Goodrich rubber products. *B. F. Goodrich Industrial Products Company, Dept. M-634, Akron 18, Ohio.*

**B.F.Goodrich**

**INDUSTRIAL PRODUCTS**

# SAVE CRITICAL ALLOYS!

## *Get high turbine alloy performance with a low alloy steel—TIMKEN "17-22-A"(S) steel contains less than 3% alloy— gives maximum creep resistance to 1,000° F.*




*Time-elongation creep curves at 900°F. show high creep resistance of "17-22-A" (S)*

You can save critical alloys by using the Timken Company's "17-22-A"(S) steel for gas turbine parts or other parts that operate at temperatures up to 1,000° F. With "17-22-A"(S) you get *high* alloy performance from a *low* alloy steel. It contains less than 3% alloy, yet it has maximum creep resistance up to 1,000° F. (The graph above shows its creep resistance at 900° F.)

Proved in 13 years of service in refinery and steam power applications, "17-22-A"(S) resists heat checking and thermal cracking; is readily workable up to 2300° F.; is easily machined and welded. And with this steel, maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking. It's another steel developed by the Timken Company, acknowledged experts in high temperature steels.

For complete information on "17-22-A"(S) steel, and its companion analysis, "17-22-A"(V), recommended for temperatures up to 1100° F., write for Technical Bulletin No. 36A. And for help with your high temperature steel problems, call upon our technical staff. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

**TIMKEN** *Fine Alloy* **STEEL**

TRADE-MARK REG. U.S. PAT. OFF.

**SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING**

# REPORT TO MANAGEMENT

### Is Diversification Necessary?

Industry is going through a phase that is unlike anything since the industrial revolution. It's a revolution, all right, but of corporate reorganization rather than manufacturing methods.

**Whether it takes the form of** adding new lines, getting out of established ones, buying other companies, or selling out to another, it boils down to one thing. The current business philosophy is success by diversification.

**The vertical company,** the industry specialist, is nearly a thing of the past. And those that remain, even though they may be in sound financial shape, are for the most part making haste to get into different fields or to join forces with other vertical industries for a broader base.

**Diversification itself** is no guarantee of success. It won't help you to go into another field if it's already overcrowded or if you aren't equipped for manufacturing or merchandising that is required. But it does broaden the company's base. If the rug is jerked from under one corner, the entire structure won't necessarily collapse.

### It's a Defensive Action

Some of the mergers or purchases you read about these days are purely defensive measures, although voluntary and amicable. The specialist, without the vast corporate network behind it, is virtually a sitting duck.

**In many cases, companies sell,** buy or merge to avoid being taken over. In other words, it's a voluntary action planned to make the move on their own terms to avoid having it done on some one else's terms later.

**A current example prominent** on the financial pages is an illustration. The larger company, although successful and solid financially, needs to broaden its product base. The other, equally successful in its own line, needs the advantages of a larger corporation. Without the corporate union, both could be in dangerous positions.

**Diversification can be overdone** and has been. You are familiar with companies that diversify themselves right out of business. New fields won't help poor management, may make it even worse.

**Reason for the trend is** obvious. Decisions of the auto industry, for example, to make more of its own parts left many auto suppliers out on a limb. Those with other lines had the best chance of survival.

### How Will SUB Work Out?

June 1 will mark an important industrial event. It will launch the auto industry's controversial supplemental unemployment benefit program that was won a year ago by the autoworkers.

**There are other forms of** the "guaranteed annual wage" in industry, but not involving the number of workers that are affected by the UAW pacts. Furthermore, with the auto industry in somewhat of a slump, the practicality of the present contract will get an immediate test. (See Special Report, p. 99, for detailed analysis.)

**Two facts will be immediately** apparent: The present plan is loaded with inequities, will be re-worked at future negotiations. The present form of financing at 5¢ per hour is apparently adequate.

### A Look at Consumer Credit

The Federal Reserve Board is about to launch a thorough study of consumer credit. It no doubt will provide the basis for future credit policies of the "Fed."

**Some of the touchy areas include** plans of buyers of 1954 and '55 cars, used car dealers, views of the consumer credit industry itself and other credit-heavy markets.

# INDUSTRIAL BRIEFS

**Allen In Chicago** . . . The assets of Allen Manufacturing Co., Hartford, Conn., have been acquired by the Chicago Pneumatic Tool Co. Allen, manufacturers of Allen Head set screws and cap screws, and other hex-socket products will become a subsidiary of Chicago Pneumatic Tool Co. The new company, incorporated in Delaware, will retain the same name, present personnel, but company and sales policies will not be altered. Manufacturing and selling operations of the Hartford concern will not be affected.

**Looking For Data** . . . Electro Metallurgical Co., div. of Union Carbide and Carbon Corp., producers of ferro-alloys and metals, announces formation of the Marketing Research Division within the Sales Dept. The Division will be responsible for phases of market research and development of secondary markets for the company's products.

**Rating High** . . . The American Institute of Metallurgical Engineers has awarded the 1956 Journal of Metals Award to Dr. Richard D. Burlingame, a chemical engineer in the Central Research Div. of Cargill, Inc. for his paper on the processing of low-grade taconite ore.

**Aid at Hand** . . . Science and engineering students from 40 of the nation's colleges and universities are conducting laboratory experiments with the help of $600,000 worth of the latest laboratory equipment obtained from General Electric Co.'s equipment assistance program. Colleges and universities with special problems in modernizing their laboratories or bringing them up to peak efficiency may apply to G.E. assigned contact men for equipment aid.

**Down Mexico Way** . . . Pennsylvania Salt Mfg. Co. has expanded operations in the Republic of Mexico. Nearing completion is an agricultural chemical processing plant and distribution center, providing expansion of Pennsalt de Mexico's central plant and office facilities in Mexico City and established a base for the distribution of the company's full line of chemicals for industrial, farm and home use.

**Change and Exchange** . . . Pressed Metals of America, Inc., Port Huron, Mich. will merge into American Bantam Car Co., Butler, Pa. The American Bantam listing on the American Stock Exchange is being changed to Pressed Metals of America, Inc. The newly named concern will continue to manufacture its line of automotive parts at its present locations and under the same management.

**That's the South** . . . Allis-Chalmers Manufacturing Co. announces distributors in four southern states for general purpose equipment. New distributors are: The McGowan Electric Supply Co., Tallahassee; Major Electric Supplies, Fort Pierce, Fla.; Colossus Industries, Inc., Shreveport, La.; Empire Machinery & Supply Co., Norfolk, Va.; and Mill & Textile Supply Co., Inc., Birmingham, Ala.

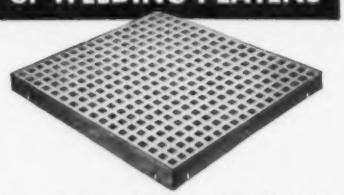
**Award** . . . The National Science Foundation has awarded $13,000 dollars to Carnegie Institute of Technology for studies aimed at diminishing air pollution. Principal investigator will be George Westinghouse, professor of engineering and Gaylord W. Penney, inventor of the Precipitron, electrostatic precipitator, which clears the air in ventilating systems.

**Cut Tin Use** . . . American Can Co., has developed a new process that promises to take 98 pct of the tin out of more than 10 billion tin cans. The development, known as margin plating, consists of tinplating only the narrow margins of the steel plate that form the soldered sideseams of the cans. Except for these margins, which are approximately three-sixteenths of an inch wide, the cans are made entirely of enameled steel plate, according to Canco's vice president in charge of research and development.

**Future Outlook** . . . The ordnance plant of Vickers Inc. has been selected as the site for a series of national industrial expositions to be conducted in October under the sponsorship of industry, business, labor, finance and city, state and federal government agencies. Plans are being made to accommodate some 250 exhibits.

**Joining the Ranks** . . . A new corporation, Tube Co., Inc., has been formed to manufacture and market welded steel tubing. Paid in capital of the corporation will be $250,000.00. Production equipment is on order and ground has been broken for a modern 11,000 sq ft building at Owatonna, Minn.

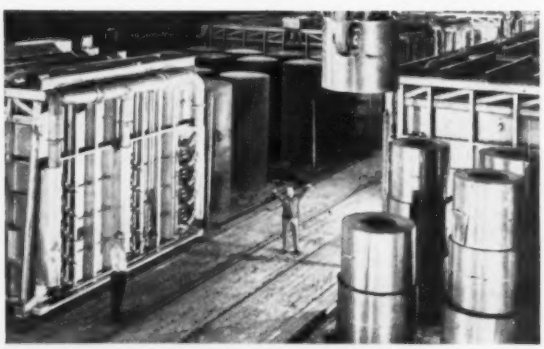

BENDING BLOCKS or WELDING PLATENS



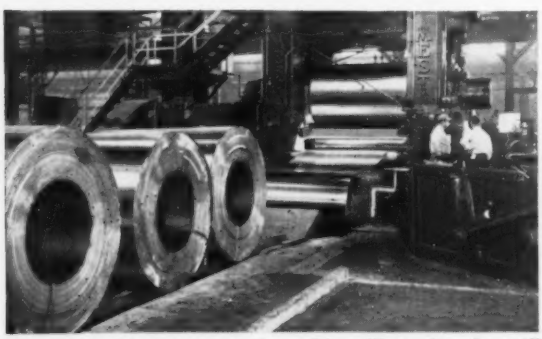
4 ft x 4 ft—5 ft x 5 ft—5 ft x 6 ft. Also other sizes. Cast steel blocks for layout, welding & assembly. Tools, stands & accessories. Write today for information.

ACORN IRON & SUPPLY CO.
Delaware Ave. & Poplar St., Philadelphia 23, Pa.

# How Great Lakes Steel *puts the pressure* on quality



COILS ARE ANNEALED in these giant ovens to impart maximum softness and ductility. And then . . .



COILS ARE TEMPER ROLLED in a skin mill to give the stiffness, surface and flatness which have been specified by the customer for the order.

Right on the nose—not too hard, not too soft! This steel coil passes the Rockwell Test with tolerance to spare.

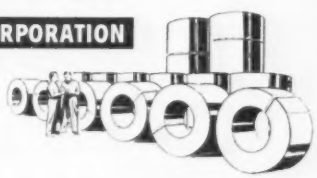
In the Rockwell, or hardness test, pressure is put on a sample piece of coil by a system of loads applied through a tiny ball. A needle gauge signals the depth of the impression. From this, our test engineers can readily tell: (1) if the coil was annealed to maximum softness for extra-deep drawing; and (2) if it is now properly tempered to meet customer specifications.

Quality control every step of the way—yes, that's our most important job at Great Lakes. Reason enough to call us and talk over your steel needs?

**GREAT LAKES STEEL CORPORATION**

Ecorse, Detroit 29, Michigan • A Unit of

**NATIONAL STEEL CORPORATION**



*District Sales Offices:* Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

# Future Bright Despite Current Lag

**H. H. Curtice revises estimate downward . . . But 1956 will be the industry's third best year nonetheless . . . Vigorous expansion plans a bellwether of record years to come—By *T. L. Carry*.**

◆ FOR THE FIRST time since he has been making predictions, the nation's leading auto executive has revised downward his estimate of what the domestic outlook is for cars and trucks in 1956.

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**Look, Don't Leap** . . . As a result of Mr. Curtice's latest statement, a great many people in Detroit have been ducking for cover. They base their fears on the GM executive's ability to gage the market in a consistently accurate manner.

But before dropping off the deep end, it is best to stop and analyze just precisely what Mr. Curtice said.

Granted that the market for new cars has left something to be desired this year, when the total is added up next December the figures will show that 1956 is the third best year in the history of the industry.

Judged from the standpoint of the number of cars that have been sold in other years, the figure of 5.8 million still looms rather large. It is at the rate of a little less than 500,000 cars a month and this is nothing to be sneezed at when you consider that in years gone by a 5 million car year was considered big stuff.

**Bright Future** . . . At the same time, it is best to keep in mind that, although the industry is suffering from the effects of a lag in sales right now, the long range outlook for automobiles is still extremely good.

The tipoff to the confidence with which the industry views the future is the amount of money that has already been allocated for capital expenditure. It is safe to assume that if the various automakers were not confident they would not be laying out literally billions of dollars for new plants and equipment.

So, although there are some sections of the country and isolated segments of the economy that are currently suffering from the lag in the automobile market, the outlook for the future is still extremely bright.

Apparently, Harlow Curtice is not afraid of the future and is confident that in the not-too-distant future automobile producers and their allied suppliers will have to be geared to a normal production year in the vicinity of 8 to 9 million automobiles.

And that time is not far off. It is likely to be here in another 5 to 8 years.

## Auto Layoffs Worry Congress Too

**▪ Congress would like to assure itself that employment slackness in the auto field is not an indication of weakness in the general economic picture.**

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## Higher Octane Probed

Development of higher and higher octane gasoline for cars isn't as easy as it sounds.

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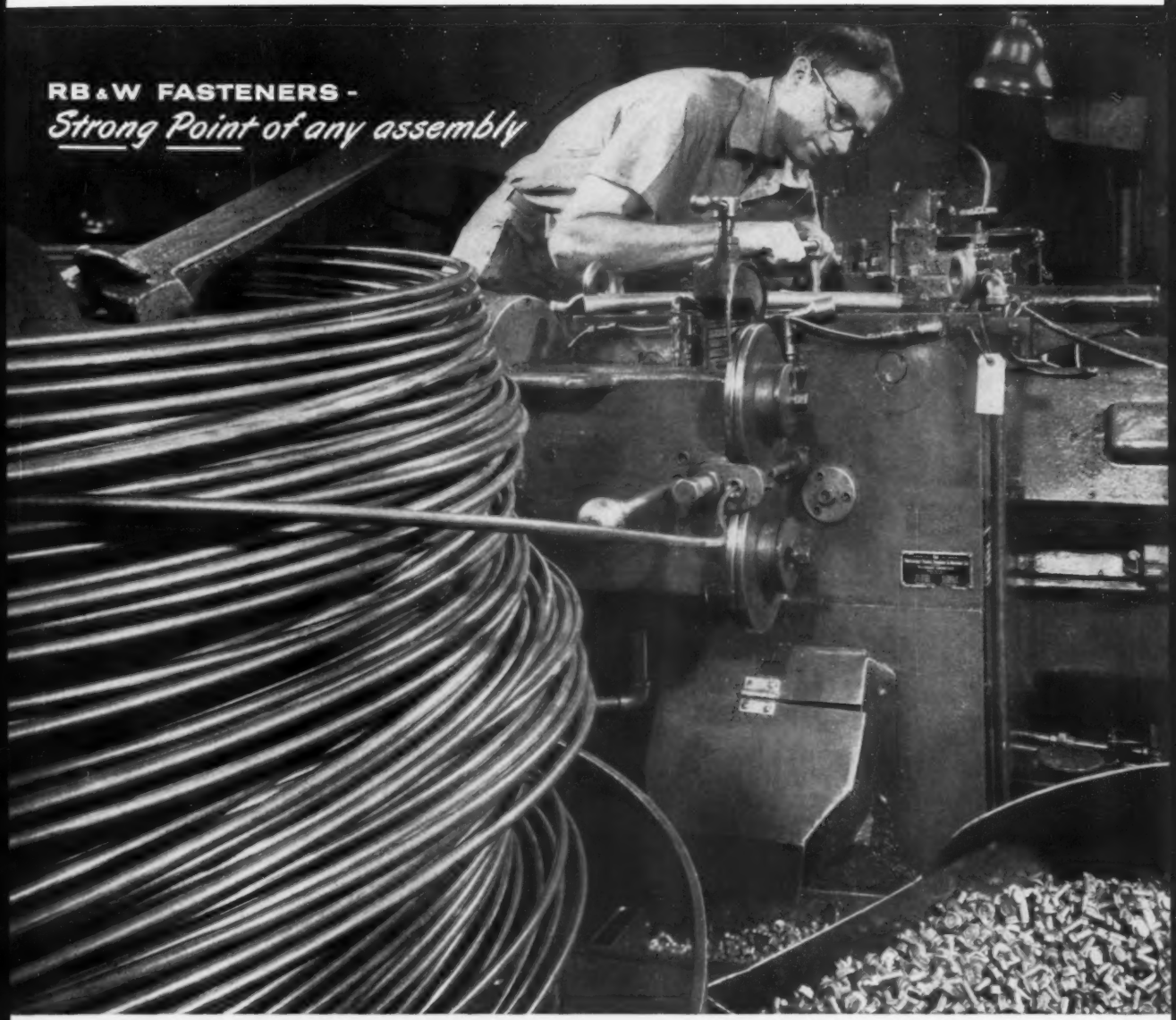


# Getting set to pound some strength into bolt heads

HERE ARE three essentials for producing strong, low cost fasteners ...an ingenious machine, indispensable skill and proper material.

That's a cold header you see. It deals wire terrific blows, forcing it to flow cold inside dies. Skillfully set up, it spills out bolt or screw blanks by the thousands per hour—all with *strong*, sound heads.

Making precise adjustments on the machine is Douglas Dunaway. With RB&W for ten years, he's one of many long-timers whose experience assures high quality output from a vast array of modern equipment.

The cold heading method (an RB&W development that revolutionized bolt making) calls for use of uniform, high quality raw material. With constant quality control, RB&W makes *sure* cold headers get the proper "diet".

It's this combination of facilities, experience and quality control in all RB&W plants that assures more fastener quality for your money . . . a truly reliable supply source . . . and strong fasteners that never let you down.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B & W

110th year

**Plants at:** Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors** from coast to coast.

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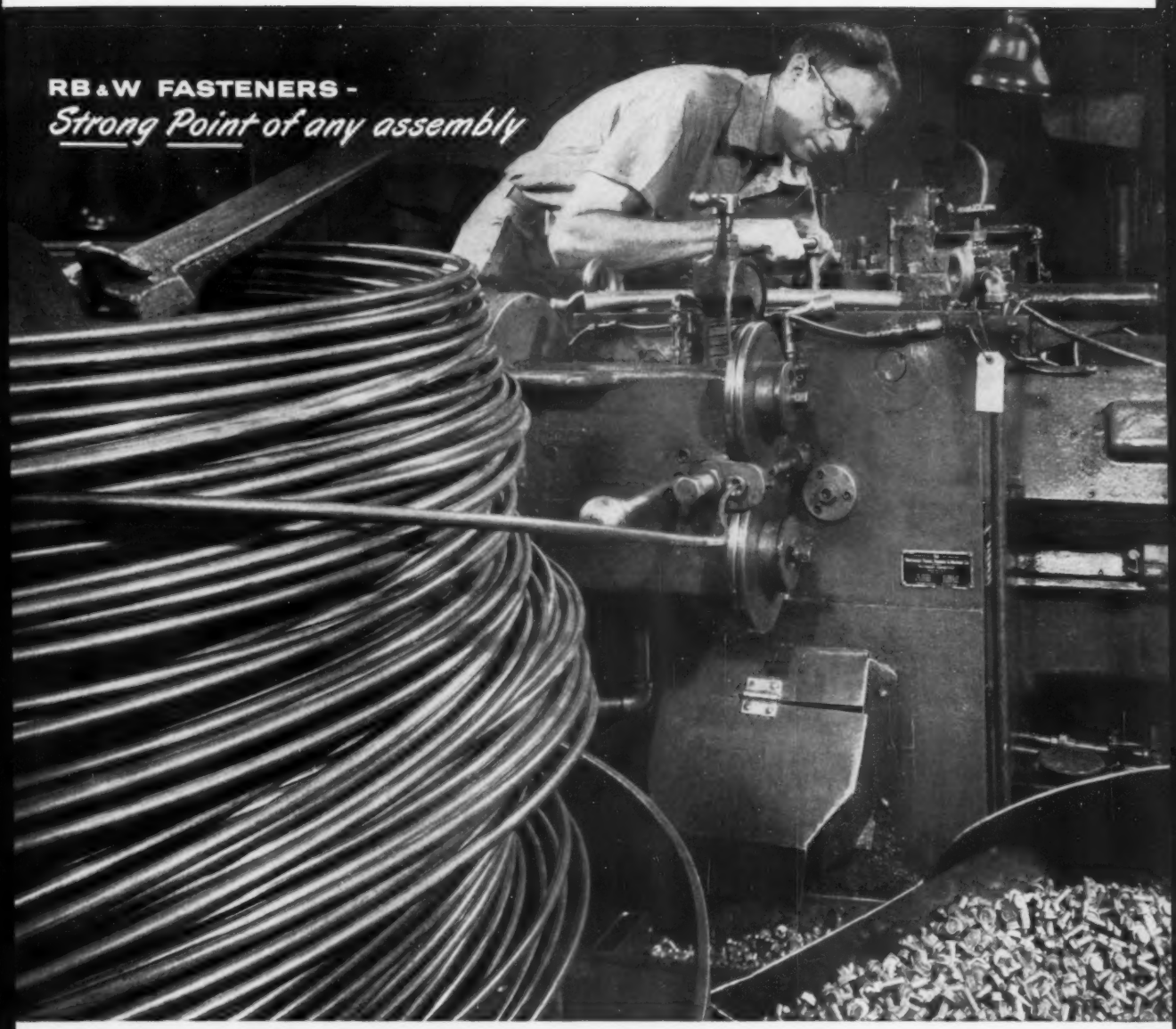
Development of higher and higher octane gasoline for cars isn't as easy as it sounds.

Two Ford Motor Co. engineers told the American Petroleum Institute in Montreal last week that higher octane gasoline is desirable only if it can be developed




# Getting set to pound some strength into bolt heads

HERE ARE three essentials for producing strong, low cost fasteners ... an ingenious machine, indispensable skill and proper material.

That's a cold header you see. It deals wire terrific blows, forcing it to flow cold inside dies. Skillfully set up, it spills out bolt or screw blanks by the thousands per hour — all with *strong*, sound heads.

Making precise adjustments on the machine is Douglas Dunaway. With RB&W for ten years, he's one of many long-timers whose experience assures high quality output from a vast array of modern equipment.

The cold heading method (an RB&W development that revolutionized bolt making) calls for use of uniform, high quality raw material. With constant quality control, RB&W makes *sure* cold headers get the proper "diet".

It's this combination of facilities, experience and quality control in all RB&W plants that assures more fastener quality for your money . . . a truly reliable supply source . . . and strong fasteners that never let you down.

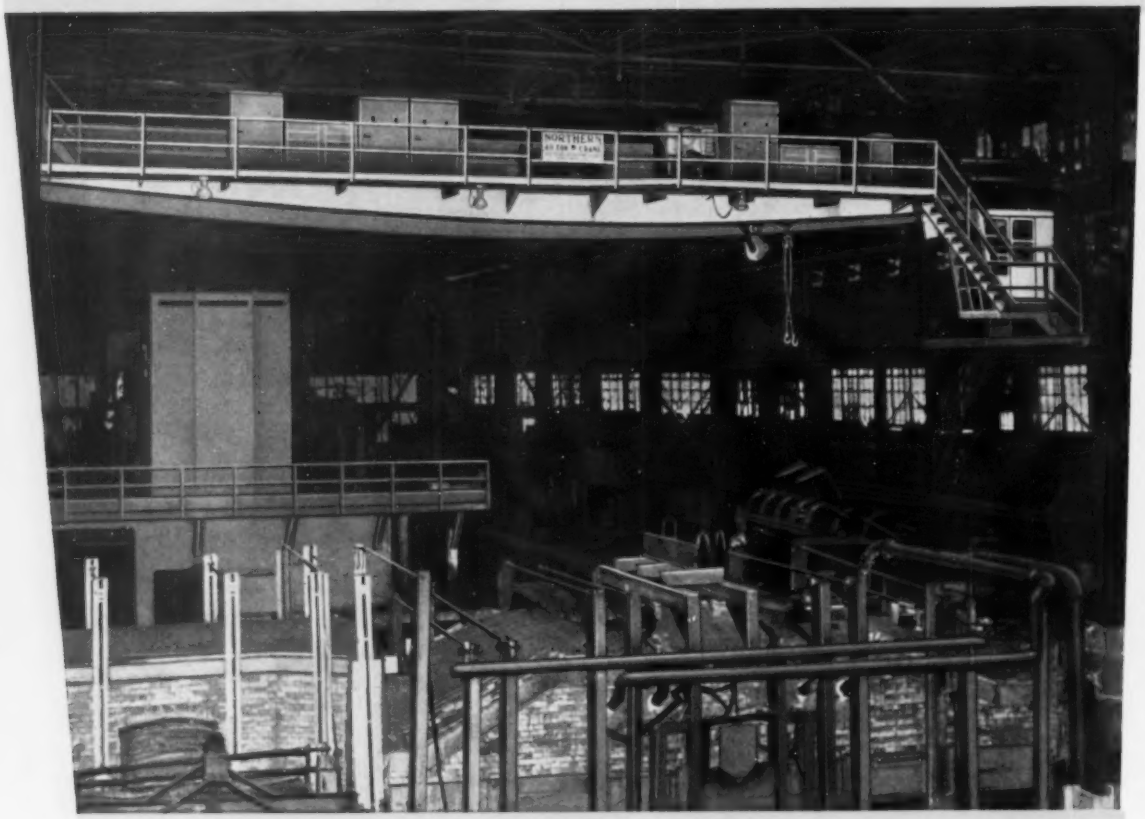
Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B & W

110th year

**Plants at:** Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors** from coast to coast.

# Look overhead..see "NORTHERN"



## Production Tooling for Production Materials Handling

Mechanized production processing — automation — with its hooking up of special purpose units, devices and controls designed to increase productivity — must be increasingly dependent on special purpose production tooling of all kinds—including overhead materials handling equipment.

NORTHERN OVERHEAD ELECTRIC TRAVELING CRANES—for wide spans—capacities up to 150 tons — when correctly custom-built for special purpose use — can quickly earn their cost in only a few years when they are fully integrated in your production planning.

*Let us send you Technical Bulletin W-101.*

**NORTHERN CRANES—HOISTS—TRAVELATORS**

**NORTHERN ENGINEERING WORKS**

210 CHENE ST. • DETROIT 7, MICH.

**Automotive Production**

*(U. S. and Canada Combined)*

| WEEK ENDING | CARS | TRUCKS |
|---|---|---|
| MAY 19, 1956 | 118,011 | 23,956 |
| MAY 12, 1956 | 116,687 | 24,826 |
| MAY 21, 1955 | 187,499 | 34,437 |
| MAY 14, 1955 | 187,956 | 33,790 |

*Estimated. Source: *Ward's Reports*

without sacrificing other important qualities of automotive fuel.

A. E. Cleveland and R. I. Potter, of the Ford Engineering Staff pointed out that one of the biggest dangers in the creation of higher octane gasoline is the increase in vapor pressure which will lead to increased fuel handling difficulties.

If the fuel becomes too highly volatile, it will result in vapor lock, difficult hot starting and carburetor icing.

The problem becomes even more complex when you consider that engines are becoming increasingly larger. The constantly increasing compression ratios are going to call for higher octane fuel.

The engineers suggest that problems of adjusting fuels to engines should be tackled on a cooperative basis between the auto and petroleum industries.

# Suspension:

## Air to replace metal springs in GM's 1957 truck line

Predictions are that introduction of air suspension of GMC's 1957 trucks will open up a new era in transportation for the trucking industry.

Air suspension eliminates the use of conventional metal springs and uses rubberized bellows.

Heart of the system is a leveling valve which meters air either in or out of the bellows as the load in the truck varies. Thus, the air, which is supplied by a compressor to a storage tank, allows the truck to stay on a constant level at all times.

This is one of the many advantages for air suspension cited by GMC. Trucks and truck-trailer combinations have a legal height limit of 12.5 ft. Builders ordinarily must allow for what is called "deflection space" to make up the difference between loaded and unloaded height.

But if a truck and trailer are equipped with air suspension, the builder can place the floor line at the loaded height of the vehicle and actually add to its pay load.

The system is also easier to maintain. It eliminates the need for lubrication and costly maintenance repairs for springs.

In addition, tests have shown that it affords a softer ride which in turn reduces damage to fragile cargoes. In 1953, 1100 interstate trucking companies reported that their loss because of cargo damage was 53.5 pct of net income. Air suspension could not possibly eliminate all of this loss but it is estimated that it would be doing a good job if the loss was cut only 4 or 5 pct.

Air suspension is nothing new for General Motors. The GMC division has been using it on its buses since 1948. These buses have traveled more than 300 million miles. Failure of the rubber bellows to date has averaged less than one for every million miles driven. Some of the buses that have never had a bellows replaced have operated over 600,000 miles.

Adoption of the system to trucks next year has led to speculation that it will also be placed on some of GM's cars in 1957.

At this point, although it is possible to adapt air suspension to passenger cars, it is doubtful that the exact same system would be used.

It is more likely that if and when air suspension comes to automobiles it will be a modified system that also employs the use of hydraulics.

GMC will introduce the suspension next year on a new line of trucks. It will be standard equipment for vehicles with a gross cargo weight between 50-60,000 lb because this is the area which the division believes will afford the greatest advantage to truckers.



**THE BULL OF THE WOODS** — **By J. R. Williams**

DON'T GIT SORE--I WAS JUST KIDDIN'! AIN'T YOU GOT NO HUMOR?
HE KIDS THE OL' BO'Y BY ACTIN' LIKE A BULL FIGHTER IN FRONT OF HIS WHEEL BARRER, WAVIN' THAT RED SWEATER! TH' OLD BOY IS FED UP AN' IS TRYIN' TO RUN HIM WHERE ONE OF TH' BOSSES KIN SEE IT!
WELL, HE MUST BE SO MAD HE AIN'T USIN' ANY SENSE--TH' BOSS WILL THINK HE'S PLAYIN', TOO!
J.R.WILLIAMS
THE JOKER
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DYNAMATIC®

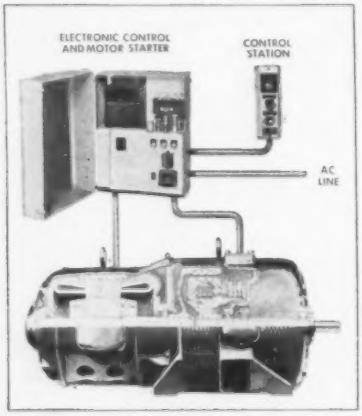
# ELECTRONIC CONTROLS

## Can Solve Your Adjustable Speed Problems

Dynamatic electronic controls with their simplicity, low maintenance, easy accessibility, and small space requirements, when used with Dynamatic Eddy-Current Drives, provide the solution to most adjustable speed drive problems.

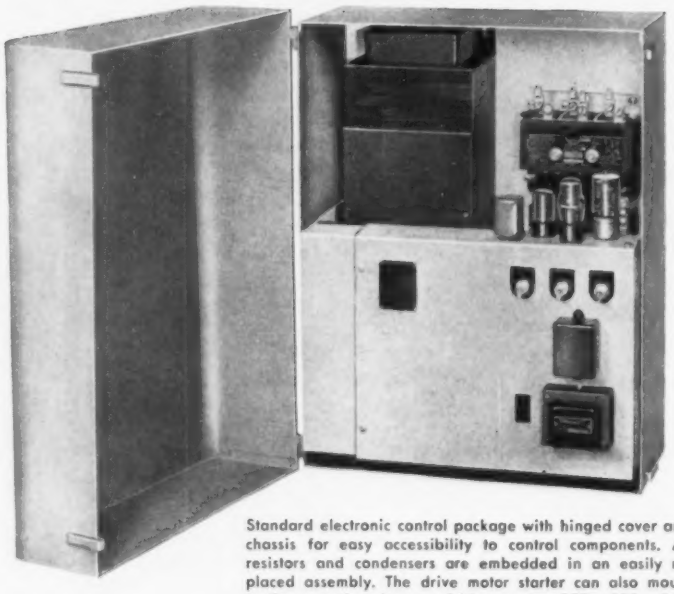
The excitation required by Dynamatic eddy-current equipment is of very small magnitude compared to the drive capacity. For example, a 440 watt control is capable of controlling the torque or speed output of a 400 HP drive. Control and excitation power is taken directly from AC lines without the need of cumbersome and complicated convertors, with their installation, ventilation, and maintenance problems.

Since the control elements have a very high amplification factor, even the largest couplings may be easily and conveniently controlled with small adjusting potentiometers.




The small illustration shows the minimum of typical components necessary to obtain adjustable speed with Dynamatic eddy-current equipment. Speed regulation requirements on the order of 1/10 of 1 per cent of drive top speed are easily and economically accomplished with suitable control modifications. With low powered reliable electronic components, requirements to suit almost all drive problems are easily met without appreciably increasing the cost or size of the control components.

The following outline of operation will indicate the many advantages of this Dynamatic control equipment.



Standard electronic control package with hinged cover and chassis for easy accessibility to control components. All resistors and condensers are embedded in an easily replaced assembly. The drive motor starter can also mount in the control enclosure, which measures 25" x 19" x 14".

Direct current excitation applied to the Dynamatic Drive coil modulates the strength of the magnetic fields and consequently, the amount of torque developed at any rate of slip between the rotating input and output members. So that the drive may satisfy load and speed demands, this direct current must be varied automatically.

Because of the drive's small power demands, rectification of easily available alternating current to direct current is a simple procedure. A gas-filled thyratron tube is all that is needed to accomplish the conversion from AC to DC. A rectifier used in conjunction with the thyratron tube, plus the highly inductive eddy-current drive coil, provides a smooth flow of direct current as required by the drive.

To obtain desired performance, a means of varying the amount of current to the drive coil must be provided. The thyratron tube provides this function in that the grid of the tube, influenced by an AC rider wave imposed upon the DC grid voltage, permits a smooth change in drive coil voltage from zero up to the available maximum.

A permanent magnet alternator, driven by the output shaft of the Dynamatic Drive, generates a voltage in direct proportion to speed. This voltage directed to the electronic control is utilized to maintain pre-set speed. With a reduction in load, speed tends to increase, but the generator signals the control so that the drive coil current decreases, slowing down the unit. Conversely, should the load increase, the drive tends to slow down so that the generator signal to the electronic control automatically increases the current, permitting the drive to return to the pre-set speed.

Speed and load (current) control are two of the standard types of electronic controls available. Because of the almost unlimited uses and adaptations of electronic components, many operations can be conveniently controlled, such as tension, acceleration, braking, threading, jogging, speed matching, and many others where an electrical signal can be fed to the control equipment.

***Send for our 16-page Illustrated Bulletin on Electronic Controls***

**EATON** —DYNAMATIC DIVISION— MANUFACTURING COMPANY

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# Look Out for New Materials Controls

**If new controls are imposed, some of those yelling loudest now would be hardest hit . . . Nickel would be earmarked strictly for defense uses . . . Ike pushes anti-pollution action—By G. H. Baker.**

◆ ANY NEW controls over end-uses of metals will be surprisingly tough on some of the very firms that are clamoring for a government allocation program.

The government has no immediate intention of imposing end-use controls over scarce metals like nickel. But a noisy handful of nickel-hungry fabricators is beating on the doors of government agencies, demanding that federal rationing of scarce metals be put into effect immediately.

**Could Surprise** . . . What a lot of these small users don't realize is that a government allocation program would exclude all non-defense users from a share of the total supply. Thus, some of the firms hollering loudest for controls would be the most severely hit by any rationing program.

Firms holding government contracts would be guaranteed their supplies, but those engaged in non-defense work would be excluded from the program, and would have to scramble in the black market for whatever supplies they could find—and afford.

**Basically** . . . Problem is to increase the supplies of scarce metals like nickel, not to impose rationing of the available meager stocks. The Office of Defense Mobilization is sponsoring a big expansion program for the nickel industry that is calculated to increase supplies by 100 to 150 million lb a year. (Available world supply is now about 300 million lb per year.) Incentives, in the form of fast amortization and guaranteed government purchase orders, are being offered to firms willing to embark on expansion programs.

## More Fresh Water

President Eisenhower is pressing for quick congressional approval of his long-stalled water pollution control bill.

The bill, which passed the Senate last year and is now pending in the House, would give the federal government a strong hand in combating industrial and municipal pollution of streams. It would also step up research into the water pollution problem and create a system of construction grants for sewage disposal plants.

Existing legislation, which is not as strong as that proposed by the President, expires June 30 and Ike wants to make sure something takes its place. There has been some Republican opposition to the measure, but GOP leaders say it is based on provisions inserted in the bill which the Administration does not favor, including a measure for large federal gifts.

## Whose Right?

Union leaders are pushing an all-out campaign to cancel "right-to-work" laws now on the books in 12 states, a top authority on labor legislation says.

Fred A. Hartley, Jr., former

## Budget Balanced, Tax Cut Unlikely

◆ THE ADMINISTRATION counts on a $1.8 billion budget surplus this year, but doesn't see its way clear to recommend a tax cut. Instead, it wants to apply it to a reduction in the nation's debt.

This is in spite of election year pressures for a cut in personal income tax, that at one time seemed likely. However, President Eisenhower maintained consistently that priority should be given a cut in debt.

If the surplus had reached $2.5 billion, it is probable that even the Administration would have conceded the advisability of a small personal income tax cut. There never was any hope in a slash in business tax levies.

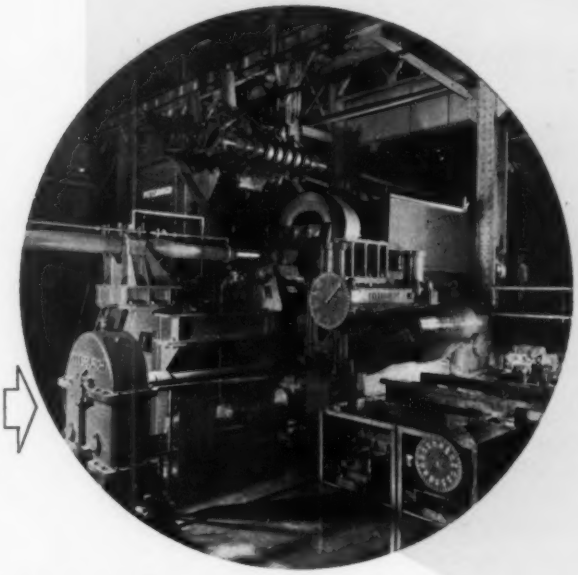
The Treasury in January conservatively forecast a surplus of only $230 million, compared with the current figure. However, government spending will run to $65.9 billion this year, $1.6 billion more than previously predicted.

Although Ike's Treasury Dept. advisors recommend against a cut in taxes, Congress is still to be heard from. It's possible that electioneering Congressmen won't see it that way.

The budget statement was contained in letters to House and Senate financial committees. It states:

"For some weeks it has been evident that the upsurge of prosperity in the Nation has increased current Federal budget receipts, and . . . current economic factors have also played an important part in increasing expenditures over earlier estimates. . . ."

excellence in design



*assures*

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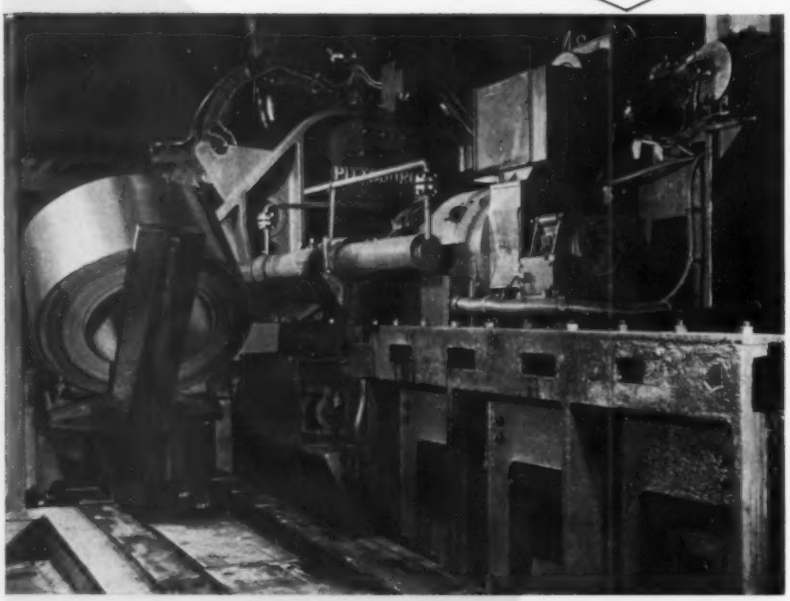

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Good design is the key to successful performance. Our engineers increased the efficiency of this hot strip mill by designing an up-coiler with special provision for delivery of the finished coil *to the side* for better plant layout.

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congressman and co-author of the Taft-Hartley labor law, also warns that the union chiefs are conducting powerful lobby campaigns in another dozen state capitals to block adoption of "right-to-work" laws.

Many of these states are highly industrialized, and in some states the union leaders are "very powerful politically," Mr. Hartley observes.

An industrial state like Indiana would not have supported a "right-to-work" law only a few months ago, he comments, but the union violence displayed at the Perfect Circle strike last year has probably caused a lot of voters to change their minds. As a result of violence of this type, he thinks "right-to-work" laws now have a good chance of being adopted in at least several more states.

## Flying Aid

Effective means of meeting America's jet-age aviation needs will be sought by three research organizations under a new $300,000 contract let by the government.

Cost of the work will be paid by the U. S. Commerce and Defense Depts. Awarded the job are the Airborne Instruments Laboratory, Inc., Mineola, N. Y.; Cornell Aeronautical Laboratory, Inc., of Buffalo; and Aeronautical Research Foundation, of Boston.

Edward P. Curtis, named earlier this year as special assistant to President Eisenhower for aviation facilities planning, will supervise the study. It will include research on civil and military air requirements for navigation aids, air traffic control, communications, airways, and airports.

# Atomic Energy:

### Explosion insurance is nuclear power problem.

Private nuclear power projects are reaching the stage where the possibility of a reactor explosion, however remote, must be considered and planned against, the Atomic Energy Commission argues in a new appearance before Congress.

A catastrophic accident, such as the rupture of the core of a 100,000-kw reactor, might result in the immediate death of 20 to 50 persons and the serious exposure of another 300 to 500 to high levels of radiation, the AEC estimates. Possible financial liability in such a case is alarming to even the largest commercial insurance companies.

### The Problem

Coverage for workers in the atomic industry itself is not a serious problem for the private insurers, but the matter of third-party (public) liability involves a much larger financial commitment. Insurance firms are prepared to offer as much as $65 million in public liability coverage per plant.

Even this very substantial amount is not believed adequate by operators of the private A-power facilities, says AEC Chairman Lewis Strauss. He maintains that lack of greater protection in case of accidents is a primary obstacle to faster private development of nuclear power facilities.

Mr. Strauss proposes that the government remove this obstacle by offering to indemnify or reinsure losses in excess of $65 million per plant. Terms would apply solely to liability for injury or damage caused by the dangerous properties of nuclear material, and would not cover loss or damage resulting from negligence on the part of plant management.

### No Ceiling

Proposed legislation offered by the AEC would place no ceiling on the amount of coverage available to the industry licensee who builds and operates an atomic plant. Government authority to provide indemnity would extend for 10 years from the date the bill becomes law.

AEC would be directed to use to the fullest extent the services of private insurers, who are now studying the question of suitable rates and are experienced in dealing with claims. Furthermore, the government is to step out of the indemnity program if at the end of the 10-year period this activity is shown to be superfluous.

Private insurance companies confess that they regret the apparent move toward a federal indemnity operation, but add that they see no alternative now. Lack of full protection against catastrophic loss is slowing the progress of private atomic power expansion, says one insurance business spokesman.

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## Good Jobs Deserve Good Pay

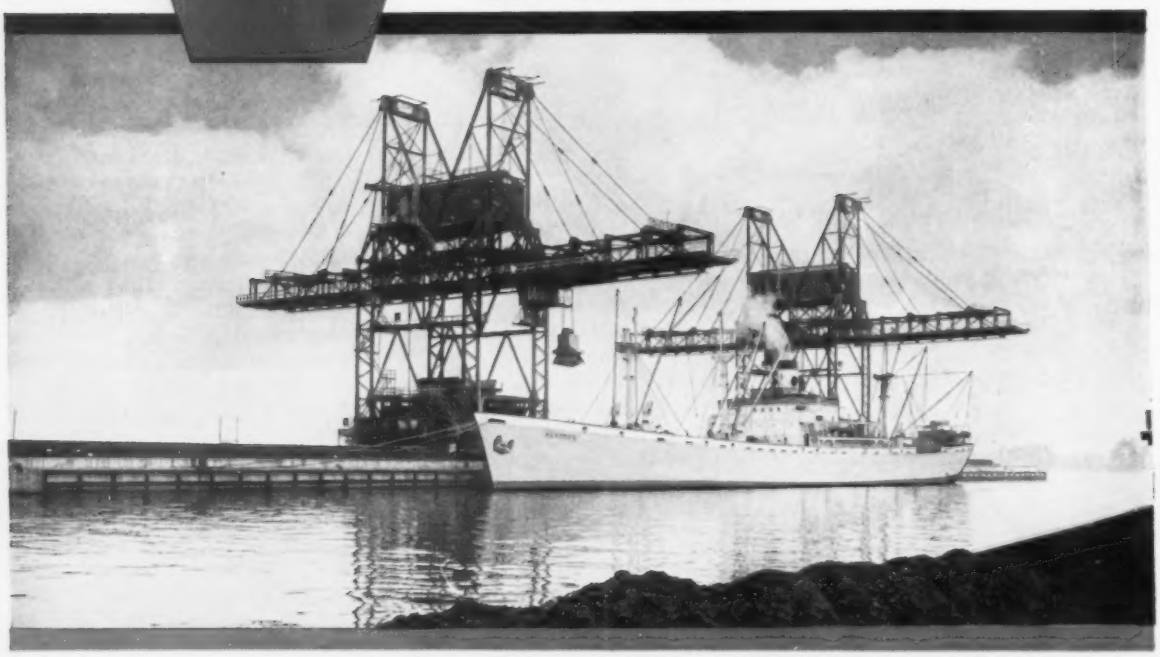
**▪ Scientific studies in the government, including research on guided missiles, will be handled by better paid staffs—if Congress sees the light in new recommendations by the House Civil Service Committee.**

**▪ Recommendations affect some 375 scientific and professional positions in the Defense Dept. and other Federal agencies. No new jobs are created, but it will make possible raising salaries of experts whose pay is not up to their responsibilities.**

**▪ Breakdown by agency shows 230 of the raise recommendations involve Defense Dept., 50 in National Security Agency, 50 in National Advisory Committee for Aeronautics, 35 in Commerce Dept., and 10 in Bureau of Mines.**

**▪ Pay range for the scientific positions is from $10,000 to $15,000 per year. Total cost of recommendations: $2 million annually.**

new Pennsylvania RR pier
handles **up to 3600** tons
per hour with **BROWNHOIST**
**ore unloaders**



**60 tons a minute! Seems incredible, but that's the production pace set by these two giant Industrial Brownhoist ore unloaders at the new Pennsylvania Railroad pier in Philadelphia, Pennsylvania. Towering over both pier and ocean-going ore vessels, the two enormous Brownhoist machines—each with a free-digging capacity of 1800 tons per hour—provide this ore terminal with the most modern and efficient unloading facilities in the United States. They can travel the full length of the pier and lower apron extensions from either side to obtain a reach of 72 feet from the dock. Each huge 25 ton capacity bucket rolls out, takes a bite, rolls back on the apron to drop its contents into a 100-ton receiving hopper, then rolls out for another bite. Time elapsed from bite to bite? *Just 45 seconds!***

**The same engineering experience that made these Brownhoist ore bridges possible has also resulted in other fine Brownhoist materials handling equipment . . . locomotive cranes, wrecking cranes, car dumpers, traveling bridge cranes, buckets. If you have a heavy duty materials handling problem, it will pay you to discuss it with our engineers at Brownhoist.**

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# BROWNHOIST

# Farwest Big Factor In Auto Racing

**California-made engines and cars will again dominate field at annual Indianapolis classic . . . Some 150 Los Angeles firms supply custom auto parts racing made popular . . . See mail order trend—By *R. R. Kay.***

◆ RACE CAR PITS at Indianapolis are teeming. Tension's mounting. Mechanics, builders, and drivers of high-powered racers are pouring sweat over last-minute tune-ups.

"Gentlemen, start your engines" —the May 30 traditional call— will send 33 of the world's fastest cars chasing each other around the 2.5-mile Indianapolis Motor Speedway.

Five-hundred miles, 800 left-hand turns, and something under four hours later, the winner will collect a movie star's kiss and a pot of gold. Prediction: a new speed record of 135 mph average, barring accidents and bad weather.

**California's Role** . . . Again this year, California-made engines and cars will dominate the field. Powering at least 28 of the 33 starters will be the tough, reliable 270-cu-in., 4-cyl Meyer & Drake Offenhauser engine. And almost every chassis comes from Los Angeles-area shops. One maker alone, Kurtis-Kraft, will see over 25 of its chassis in this year's race.

Other "standard" equipment made in the west: Hilborn fuel injectors; Halibrand aircraft-type spot brakes and cast magnesium wheels.

Over the years, many important passenger car improvements stemmed from ideas developed on Indianapolis racers.

**Metalworking's Stake** . . . Now metalworking's interest in Indianapolis is in the big automotive specialty market which race car building went a long way to spark. Some 150 Los Angeles-area firms sell many millions of dollars worth of speed and customized equipment not only locally but all over the country. It's an important center for design and development work.

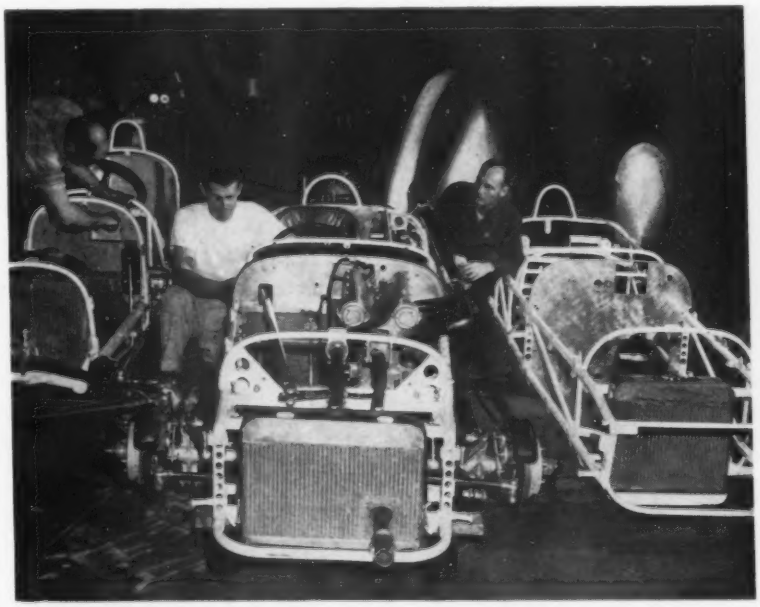
Popular speed equipment—stuff that makes a car go like a rocket —includes manifolds, head, camshafts and fuel injectors.

Custom-equipment best sellers: (1) stainless steel hood moldings; (2) grill conversion kits (take the stock grill off and put on one of your own choice); (3) power-operated kits for opening doors, windows, and the trunk; and (4) air cleaners. Ninety percent of those on the market come from the West.

**Who Buys?** . . . Basic market is the 18 to 30 age group, the after-school - before - marriage crowd. Their interest is keenest, and they spend the most.

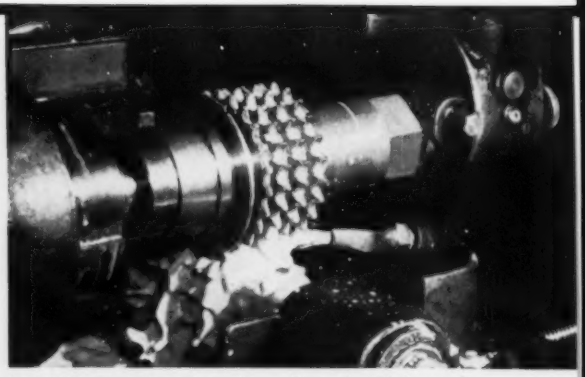
Trend: the big mail order houses are taking notice and pushing more of these specialty-type items. Much of their supply comes from here.

What makes Los Angeles such a hot bed for hot rods and sharp-looking cars? Public transportation falls pitifully short of the need. And with the area so widespread, people have to depend heavily on cars.



LAST YEAR'S WINNER in the Indianapolis race gets onceover at plant of its California designer. The firm, Kurtis-Kraft, supplied the chassis on 25 of the cars in the coming Memorial Day classic.

**TURNING AND DRILLING.** During the machining of a 9-in. piece using carbide-tipped tools, S.E.C.O. removes heat fast ...assures long runs, top speeds.



**HOBBING.** Flooding the cutting edges of a high-speed-steel hob working 1117 steel, S.E.C.O. provides lubricity and cooling power needed for long tool life.

**CENTERLESS GRINDING.** In grinding 4320 H steel pins, S.E.C.O. keeps wheels clean. Grinding dirt drops out quickly...is not recirculated. Parts are rust-protected.

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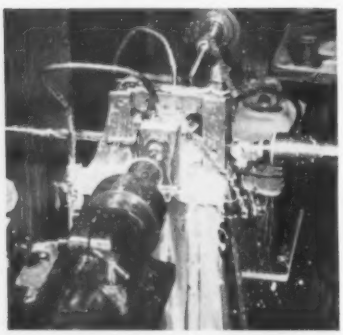

**DRILLING AND REAMING.** On steel forgings with a 350/400 Brinell, S.E.C.O. keeps drills cool...gives clean cutting.

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# Emergency Will Trigger A Tool Pool

**Program will get underway in several weeks . . . Signed contracts assure builders of ready market for rapid defense tooling . . . ODM has authorized $256 million for project—By *E. J. Egan, Jr.***

◆ MACHINE TOOL pool order conracts, "triggered" in the event of a war emergency will be ready for builders to sign in two or three weeks. Business & Defense Services Administration is now putting finishing touches on list of equipment types to be included. General Services Administration will handle actual procurement on the trigger program.

Standby contracts will be offered to about the same list of machine tool builders that participated in pool orders during World War II and the Korean emergency. In the Korean episode, 114 builders were involved.

Office of Defense Mobilization has authorized $256 million for this program. It is expected that there will be enough takers to use up the entire sum.

Contracts will cover all types of general purpose metal cutting and grinding equipment, and may involve some presses. A few "elephant" machine tools may also be included, but not the extremely large ones, such as roll-turning lathes for steel mills.

**Here's How** . . . Pool orders assure builders of a market for their products—eventually. Here's how it works: when M-Day comes, and a builder gets the go-ahead to produce the items covered by his contract, he must try to sell the equipment to the government or anyone else who can use it for war production. If he can't find a quick market, GSA guarantees to buy it. The latter alternative would actually seldom happen, however.

Purpose of the program is to give industry a quick start in tooling up for a major defense effort. Subsequent tool purchases would run far above the $256 million.

**Standard Approach** . . . A standard contract form will be used for all machine tool builders joining in the pool order project. Only description of the tool, and price will have to be filled in. Builders holding these orders can use them to get direct government loans.

## Lease Doesn't Pay

Is there any tax advantage for the machine tool user who leases his equipment, considering the more liberalized depreciation methods allowed by the 1954 Internal Revenue Act? "I, personally, see no tax advantage in leasing," says W. J. Rekstis, Jr., assistant vice president, C.I.T. Corp.

"Well, I see it's open season for speeches again!"

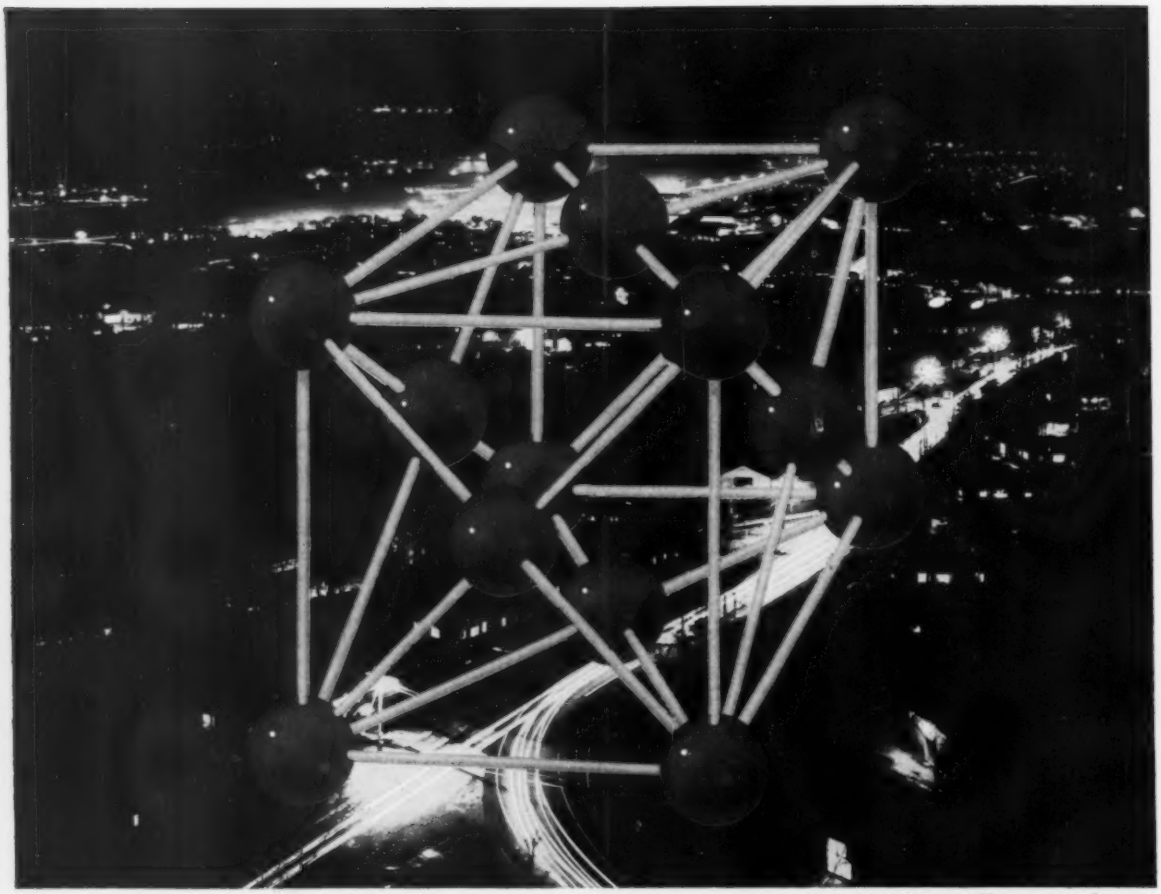
Addressing the National Association of Credit Men at their annual convention in Cincinnati recently, Mr. Rekstis said that prospective lessors usually have two attitudes about leasing: (1) they may believe it to their advantage to avoid showing the obligation of the equipment on the balance sheet; (2) they may feel that rental payments can be expensed off faster than depreciation can be taken.

The speaker declared: "There just isn't any general answer to the first consideration. Decisions on how to make up a balance sheet must be made by the individual, his accountants and attorneys."

As to the second attitude, Mr. Rekstis thinks that "the new, faster depreciation schedules pretty well take care of this argument." In his opinion, "a rental payment shown in a profit-and-loss statement is no different, in result, from a statement of depreciation expense."

Advantages of his firm's pay-as-you-depreciate program for buying machine tools were outlined. Most popular plan, according to the CIT executive, is one in which payments are geared to the sum-of-the-digits depreciation method.

Claim is that it gives all the advantages of leasing. The buyer expenses depreciation instead of rentals and writes off financing costs as well. And in the end, he owns the machine outright.



Model illustrating crystalline structure of copper, against a background view of Oak Ridge.

# COPPER

## ...essential to the Atomic Age !

When the Atomic Age dawned . . . copper was at hand to implement it.

It was *copper* that facilitated the building of nuclear accelerators or "atom smashers". . . the backbone of basic atomic research. The magnet of a modern cyclotron and its control circuits require some 300 tons of copper. And in the maze of analytical instrumentation, copper is indispensable.

The whole history of America is one of progress through inventions . . . and most inventions have in some way been dependent on copper.

The steamboat, with its copper boilers, ushered in a new Age of Water Transportation. Telegraph and telephone lines needed copper to make possible a new Age of Communications. Marconi's "wireless", with its coils and cables of copper, started the Age of Electronics.

As your Company moves ahead into the Atomic Age, move ahead with *copper . . . in every age, the metal of progress!*

## COPPER & BRASS
### RESEARCH ASSOCIATION

**420 Lexington Avenue, New York 17, N. Y.**

. . . AN INDUSTRY SOURCE OF TECHNOLOGICAL AID, INCLUDING A LIBRARY OF TECHNICAL LITERATURE AND A COUNCIL OF SPECIALISTS

**COPPER OR ITS ALLOYS PROVIDE THESE ADVANTAGES:**

Best conductor of electricity commercially available

Does not rust . . . high corrosion resistance

Best heat transfer agent of all commercial metals

Easy to machine, form, draw, stamp, polish, plate, etc.

Welds readily . . . excellent for soldering and brazing

## The Iron Age

# SALUTES

***George G. Raymond, Jr.*** **He got an early start in the material handling field and rose meteorically to the presidency of Material Handling Institute. A civic leader in Greene, N. Y., he is the town's best amateur chef.**

Moving things easily from one place to another has been a specialty with George G. Raymond, Jr., president of Material Handling Institute, since he first learned to drive the family car in 1938. While devising better ways of moving inanimate objects, he also managed to move himself up the ladder to outstanding achievement. At 34, he probably is the youngest successful material handling executive in the nation.

Almost as soon as he was able to operate on his own, Mr. Raymond displayed unusual zest for sales work, a flare for engineering and natural leadership ability . . . a fortunate combination of attributes for a lad whose family was in the manufacturing business. At the tender age of 20, while attending Cornell College of Engineering, he was named sales manager of Raymond Corp., showing rare confidence on the part of his elders in one so young. Time has proved that their confidence in his potential wasn't misplaced.

Following a two-year hitch in the Army Infantry, he returned to Raymond Corp. in 1946 and by 1955 had risen to the top executive spot. He surrounded himself with key young executives and has pushed Raymond Corp. into the limelight as a leading producer of industrial trucks and elevating equipment.

As is the case with many successful men, the momentum of Mr. Raymond's business activities carried over into civic life. He is a trustee on the Greene, N. Y., board of education, a Boy Scout committeeman and a veterans organization officer. In at least one instance, he has shown rare selflessness for a business man. A proposed $1,750,000 appropriation for a sorely needed school meant a tax increase of 50 pct for his firm, but he accepted chairmanship of the committee promoting the school.

Mr. Raymond is an enthusiastic golfer, likes water skiing and fishing. His claim to fame locally: top amateur chef.

# SEE THEM IN ACTION—
## *At The MHI'S Exposition*

**Booth 1020**

The MATERIAL HANDLING INSTITUTE'S EXPOSITION
Cleveland, Ohio
PUBLIC AUDITORIUM
JUNE 5th THRU 8th
1956
EXHIBITOR

It's a double celebration for Elwell-Parker—an outstanding exhibit of modern trucks plus a display of the world's first industrial truck, built by Elwell-Parker in 1906. You'll see the outstanding progress made in fifty years of industrial truck building.

### NEW FORK TRUCKS

Low headroom type—lower battery compartment keeps operator's head below uprights even with short mast.

Operator stand-up, center control—equipped with hydraulic lift and tilt. Models from 4,000 to 10,000 lbs. capacity.

### NEW PLATFORM TRUCKS

Hydraulic high lift models—a new concept in high lift platform truck design.

Inclined Press Die Handler—a unique truck built to handle dies in and out of inclined presses.

### WATCH THE DEMONSTRATION

The brand new models described above, together with new clamps and other fork truck attachments, plus a host of other modern fork, platform and crane trucks, will be demonstrated under simulated working conditions. You'll be sure to see plenty of cost-cutting ideas.

**THE ELWELL-PARKER ELECTRIC COMPANY**
**4295 ST. CLAIR AVENUE • CLEVELAND 3, OHIO**

50th Year MANUFACTURING INDUSTRIAL TRUCKS ELPAR
THE ELWELL PARKER ELECTRIC CO.
1906 – 1956 CLEVELAND 3, OHIO

***If you're not attending the show, send for the special "Golden Anniversary" Truck Folder.***

# The Iron Age INTRODUCES

**Carl G. Hogberg,** elected assistant vice president, Michigan Limestone Div., **U. S. Steel Corp.,** Detroit; **Donald L. Weeda,** elected treasurer, Michigan Limestone Div.

**George E. Weber,** elected vice president, will continue his duties as treasurer, **Ferro Corp.,** Cleveland; **Clifford Andrews,** elected vice president, Foreign Operations, International Div.

**H. M. Harper, Jr.,** appointed secretary, **The H. M. Harper Co.,** Morton Grove, Ill.

**William H. Fulwider,** appointed superintendent, Electrical Div., **Acme Steel Co.,** Chicago; **Dale L. Bennett,** appointed superintendent, Tool & Machine Mfg. Div., Chicago.

**Arnold Husat,** named general superintendent, Forging Div., **Transue & Williams Steel Forging Corp.,** Alliance, O.

**William L. Slotter,** elected assistant treasurer, **Standard Pressed Steel Co.,** Jenkintown, Pa.; **Joseph H. Judd,** named comptroller.

**Robert M. Clarke,** named assistant sales manager, New England, **Solar Steel Corp.,** Auburn, Mass., plant.

**Frederick Renneckar,** appointed district sales manager, Los Angeles, **Republic Steel Corp.,** San Francisco office.

**Haran W. Bullard,** named assistant to manager, manufacturing operations; **George D. Brengleman,** named superintendent, Fairfield Works mills; **J. J. Shannon,** named assistant general superintendent, Ensley Steel Works; **Robert Bruce,** named superintendent, blast furnaces, Ensley Works of **Tennessee Coal & Iron Div.** of U. S. Steel Corp.

**Dr. F. H. Buttner,** appointed group manager, market research, Product & Process Development Dept., **Electro Metallurgical Co.** Division of Union Carbide & Carbon Corp., Niagara Falls, N. Y.

**Parker Wheeler,** named sales manager, Felt Products Div., **The Felters Co., Boston.**

**Sidney B. Wetherhead,** named manager, distributor sales promotion, **Norton Co.,** Worcester, Mass.; **Elliott D. Linton,** appointed responsibilities of the Merchandising Engineering Dept.

**Kenneth M. Acton,** appointed manager, San Francisco sales branch, **Crucible Steel Co. of America,** Pittsburgh.

**Martin J. O'Brien, Jr.,** named manager, manufacturing engineering, **General Electric Co.'s** foundries in Everett and Lynn, Mass.

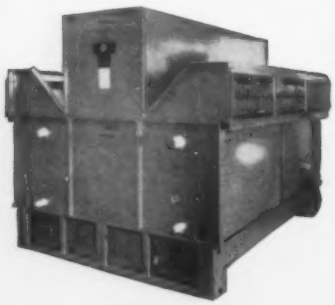
**Edward J. Kubis,** named manager, industrial sales, Railroad & Aircraft Dept., **Wyandotte Chemicals Industrial,** Wyandotte, Mich.

WILLIAM C. STUMPF, JR., elected vice president - treasurer, Jessop Steel Co., Washington, Pa.

H. D. McLEESE, elected vice president, Metal & Thermit Corp., N. Y.

JOSEPH A. VALENTIN, elected vice president and manager, sales, Michigan Limestone Div., U. S. Steel Corp., Detroit.

EDWARD P. GILLANE, elected executive vice president and director, Pratt & Whitney Co., Inc., West Hartford, Conn.



**NIAGARA SECTIONAL *Aero* HEAT EXCHANGER gives close temperature control, saves you LABOR, Power, Water**

- **Because the new design improves the heat transfer to the out-door air by evaporation.**
- **Because new features keep your equipment working for long life with "new plant" efficiency . . . always full capacity.**
- **Because you save 95% of cooling water cost.**

You get faster, more accurate cooling of industrial fluids to specified temperatures.

You improve your quality of production by removing heat at the rate of input.

You save labor in upkeep. With full access to all interior parts and piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 7,000,000 to 18,000,000 Btu/hr. No other heat exchange method gives you so much saving in money and convenience.

*Write for Niagara Bulletin No. 132*

**NIAGARA BLOWER COMPANY**
Dept. IA, 405 Lexington Ave.
NEW YORK 17, N. Y.
*District Engineers in Principal Cities of U. S. and Canada*


**H. B. Gambrell,** named assistant traffic manager; **John A. Hunter,** named administrative assistant to vice president; **William L. Smith,** named manager, commercial research; **Charles Knight,** appointed assistant manager, commercial research, **Tennessee Coal & Iron Div.** of U. S. Steel Corp., Birmingham, Ala.

**Dearl J. Speck,** named district sales manager, Oklahoma City and adjoining counties, Delta Power Tool Div., **Rockwell Mfg. Co.,** Pittsburgh.

**Howard D. Kurt,** appointed manager, product planning, Distribution Assemblies Dept., **General Electric Co.,** Plainville, Conn.

**Sidney E. Graeff,** affiliated in consulting capacity, **Salem-Brosius, Inc.,** Pittsburgh.

**Thomas B. Doe, Jr.,** appointed manager, export sales, **Vickers, Inc.,** Detroit; **Russell Dupuis,** named plant manager, Omaha Production Div.

**Dr. Robert K. Smith,** appointed manager, research, **E. F. Houghton & Co.,** Philadelphia.

**Earl W. Snodgrass,** appointed manager, Tool Steel Specialties Div., **The Standard Steel & Wire Corp.;** Chicago; **Richard C. Decker,** appointed manager, Tube Div.; **Russell B. Phillips,** named general line salesman.

**Joseph F. Sullivan, Jr.,** named plant manager, **Utilex Mfg. Co.,** Fowlerville, Mich.

**Gordon Batley,** appointed product manager, Steel Mill Products, **Fullerton Steel & Wire Co.,** Chicago.

**R. A. Shattuck,** appointed manager, Philadelphia sales, **Edgcomb Steel Co.,** Philadelphia; **P. B. Kline,** named manager, stainless steel.

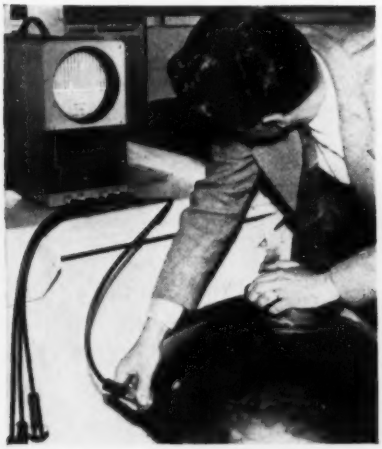
**Karl Kinder,** appointed assistant construction auditor, **Wheeling Steel Corp.,** Wheeling, W. Va.

J. POTTER CUNNINGHAM, elected president, Potter & Johnston, subsidiary of Pratt & Whitney Co., Inc., Pawtucket, R. I.

L. S. MOBLEY, named chief engineer, Southern Steel District, Republic Steel Corp., Gadsen, Ala.

ROGER M. McCRAY, named product sales manager, Kennametal Inc., Latrobe, Pa.

MARQUIS P. ORR, appointed assistant manager, roll sales, Mackintosh-Hemphill Division of E. W. Bliss Co., Pittsburgh.

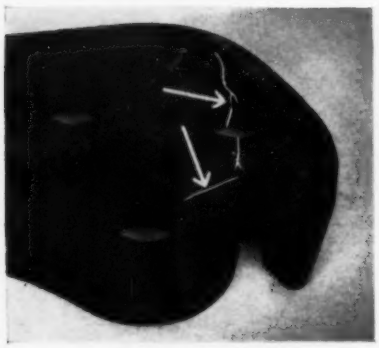


**WATCHING YOUR WEIGHT** can be important—especially in the aircraft industry. Excess weight can reduce the range and payload of a plane. A major aircraft manufacturer uses M Sonizon units to ultrasonically measure thickness of sheet and formed shapes. This controls weight by eliminating excessive thickness.

# Case Studies: NONDESTRUCTIVE TESTING SYSTEMS

Magnaglo and "black light" show up cracks as glowing indications on rough castings at a Peoria, Illinois foundry.

## How Nondestructive Testing Helps You Make Better Products . . . Cheaper



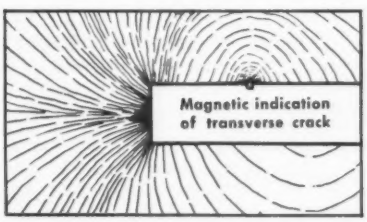
**HEAT CRACKED THE JAW**—The jaws of steel strapping machines must be reliable. Yet, following the heat treating, invisible cracks were discovered with Magnaglo as shown above. Immediate correction of the heat treat cycle eliminated the cracks. No further machine time or labor was expended on defective jaw parts, since none were made, and none scrapped!!

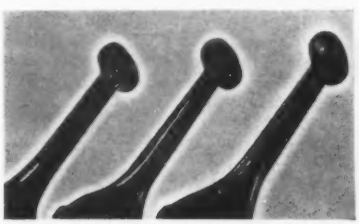
Most manufacturers can achieve definite, worthwhile savings by using one of the M testing systems for improved production control. These nondestructive inspection methods include: Magnaflux, for wet or dry magnetic particle inspection; Magnaglo, fluorescent particle inspection; Magnatest, eddy current electronic testing; Zyglo, fluorescent penetrant inspection; Spotcheck, dye penetrant inspection; Sonizon, for ultrasonic measurements; and others.

The M testing systems are equally effective for preventative maintenance or manufacturing inspection.

Most manufactured products contain one or more types of casting, forging weldment, machined or formed part. Where cracks cannot be tolerated in the final product, maximum production economy must be obtained from the very outset. Defects must be discovered as early as possible in order to eliminate wasted effort in final processing or assembly.

Magnaflux methods pinpoint early defects, and help you eliminate their cause. This results in savings of time, labor and additional long range benefits from increased salvage and reduced amounts of scrap. For detailed information as to how one of the M inspection methods can help you produce better and save more, write or call for an interview with a Magnaflux engineer. No obligation, of course!



HOW MAGNETIC FORCE DETECTS MECHANICAL DEFECTS

M nondestructive testing is based upon simple magnetic principles. A part to be tested is first magnetized—then magnetic powders or fluorescent particles in oil are applied. Surface defects cause a break in the magnetic field—local magnetic poles cause particles to be held on part to mark extent of defect. Above—a Magnaglo indication on truck connecting rods.

THE HALLMARK OF THE BEST SYSTEMS FOR NONDESTRUCTIVE TESTING

MAGNAFLUX CORPORATION

**Write for complete details concerning any of the above case studies, or ask for our new booklet on "Lower Manufacturing Costs."**

***Take Your Inspection Problems to the House of Answers***

**MAGNAFLUX CORPORATION**

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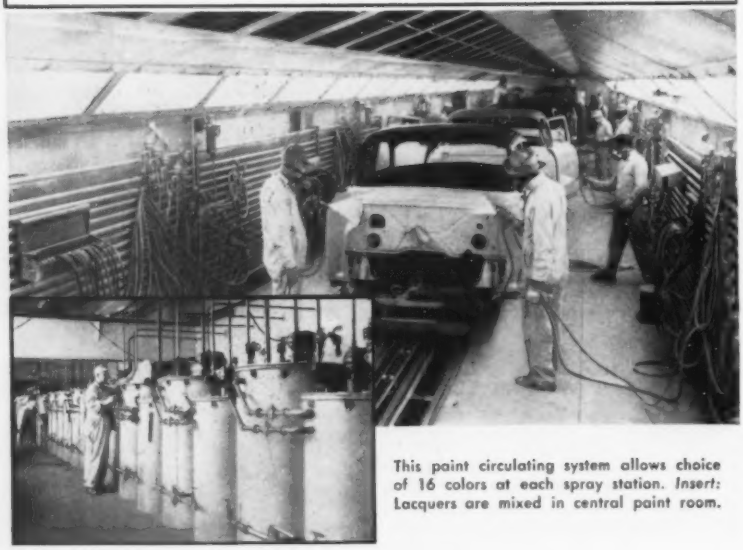
New York 36 • Pittsburgh 36 • Cleveland 15 • Detroit 11 • Dallas 19 • Los Angeles 58

# WHAT'S NEW in paint circulating systems



This paint circulating system allows choice of 16 colors at each spray station. *Insert:* Lacquers are mixed in central paint room.

## Automatic paint circulating system guarantees Packard body parts will match

***Here's how a closed-type Binks Paint Circulating System insures Packard's quality control***

The lacquer sprayed by every paint spray gun in Packard's new Conner Avenue Plant in Detroit comes from a central source. This insures that parts painted in one end of the plant will perfectly match those finished in another section.

Paint for all operations is prepared under laboratory control in a fireproof paint mixing room which houses 22 dual tanks (each consisting of a separate mixing tank and supply tank), and 11 single units which combine a mixing and supply tank. Paint is mixed and maintained at 77° F. Color and viscosity are precisely controlled.

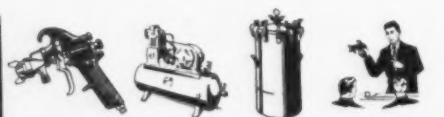
16 colors are piped from the tanks to all spray stations. In a matter of seconds, any sprayer can connect his gun to the line carrying the desired color. Uniform and measured paint delivery to each gun is assured by the use of Binks PM-103 Regulators. Atomizing air pressure is closely controlled by Binks AO-120 Oil and Water Extractors at each station.

The Packard paint circulating system allows 52 possible color combinations and is set up to apply 4 coats of lacquer in 2 or 3 tones. More than 400,000 gallons of lacquer are used each year.

Packard's choice of a Binks paint circulating system and Binks equipment is another example of how that company maintains "Complete Coordinated Cooperation" in all production.

***If your production setup*** has 2 or more spray stations using in excess of 50 gallons of paint each day, it will pay you to investigate this type of installation. The more paint you use, the greater your savings. To learn of the many other advantages of a Binks Paint Circulating System, see your jobber or distributor, or write directly to:

**Binks**
*EVERYTHING FOR SPRAY PAINTING*



GUNS COMPRESSORS FLUID TANKS FREE INSTRUCTION

**BINKS MANUFACTURING COMPANY**
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## PERSONNEL

**A. Robert Lafond,** appointed assistant sales manager, Steel Shelving and Bins Div., **Borroughs Manufacturing Co.,** Kalamazoo, Mich.; **Robert Cody,** named assistant sales manager, metal office furniture.

**Robert W. Miller,** appointed specialist, induction heating, Process Machinery Div., **The Cincinnati Milling Machine Co.,** Cincinnati.

**Jack A. Yoblin,** appointed carbide products development engineer, Carboloy Dept., **General Electric Co.,** Detroit; **Paul D. Wright,** appointed research engineer, Advanced Development Section.

**L. W. Tomlinson,** appointed purchasing agent, Television-radio Div., **Westinghouse Electric Corp.,** Metuchen, N. J.

**Charles W. Glunk,** appointed chief ceramic engineer, **A. P. Green Fire Brick Co., Ltd.,** Toronto; **Charles G. Perry,** named district sales manager, Richmond.

**Donald P. Gardner,** named field sales engineer, Michigan and Western Ohio, Loewy-Hydropress Div., **Baldwin - Lima - Hamilton Corp.,** Detroit.

Following appointments are within the **Allis-Chalmers Industries Group,** Milwaukee. **Henry M. Brundage,** named sales representative, Chattanooga district office; **Donovan R. Seward,** named sales representative, Philadelphia district office; **Robert P. Reider,** named sales representative, Peoria, Ill., district office; **Oliver G. Leonard,** appointed service engineer, Rocky Mountain Region, Denver headquarters.

**Jack Gabrielson,** appointed representative, Northern Chicago, **Allied Research Products, Inc.,** Baltimore.

**Joseph P. McGuire,** named Midwest sales representative, **Climax Molybdenum Co.,** New York.

# THIS TEAMWORK PAYS OFF

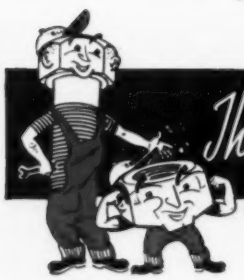
## for You!

Whenever you need a lift with a fastener problem enlist the help of your Lamson salesman, or the Industrial Distributor salesman who sells you Lamson products.

Either can call in "ELL" & "ESS" for expert assistance . . . and at no cost to you.

"ELL" & "ESS" represent the many extra services that Lamson & Sessions offer its customers. These include engineering counsel, selecting the right fastener for the job or suggestions for production economies.

This kind of teamwork is yours for the asking from Lamson & Sessions, the country's leading bolt and nut manufacturer.



The LAMSON & SESSIONS Co.

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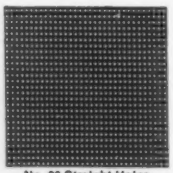
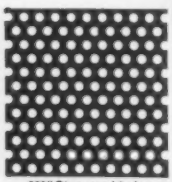
PLANTS AT CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO

## Perforated Materials for *Every* Application

Contact H & K for any perforated materials your product may require.

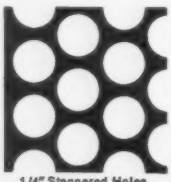


No. 00 Straight Holes
952 holes per sq. in.
.020" diam. 30% open.



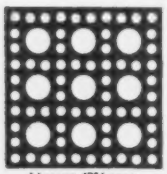
.060" Staggered holes.
126 holes per sq. in.
3/32" centers. 36% open.

We have tools for perforating thousands of different patterns.



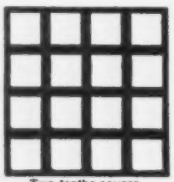
1/4" Staggered Holes.
5/16" centers.
.25" diam. 58% open.

We will be glad to work with you on your perforating problems.



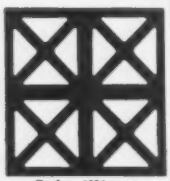
Lincane 47% open

See our catalog in Sweet's Product Design File.



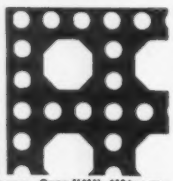
Two-tenths square,
64% open.

Perforating all metals, Masonite, plywood, paper, cloth and plastic.



Perfex 40% open

Round holes, square holes, slots, ornamental patterns, oblong holes, oval holes.



Cane "41" 41% open.

Fill-in and mail coupon to office and warehouse nearest you.

THE **Harrington & King** PERFORATING CO.

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5619 Fillmore Street
Chicago 44, Ill.

New York Office and Warehouse
118 Liberty Street
New York 6, N. Y.

Please send me—

- ☐ GENERAL CATALOG NO. 62
- ☐ STOCK LIST of Perforated Steel Sheets
- ☐ SAMPLES of Perforated Plastics and Paper
- ☐ PRICE INFORMATION (NOTE: Send specifications of perforated materials wanted. If necessary send drawings or sketches.)

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____


# Handling Show Preview

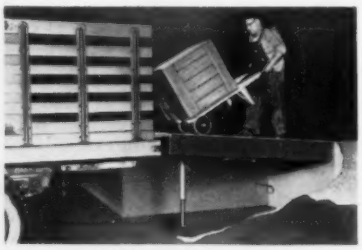
**More than 150 manufacturers will offer the latest in equipment and handling techniques at the MHI Exposition. Here's an advance look at what's being shown.**

### WANT MORE DATA?

***You may secure additional information on any item briefed in this section by using the reply card on page 181. Just indicate the page on which it appears. Be sure to note exactly the information wanted.***

## Lift and leveler featured

The modern factory scene with its applications for lifting, loading and positioning operations will be shown in a series of 3-dimensional, animated dioramas at this company's show booth. Techniques in loading trucks, trailers and rail cars will be demonstrated by the firm's oil-hydraulic powered platform Lift which raises the cargo from the floor to the vehicle. In addition the display will feature the Trans-O-Matic Ramp which



links the dock edge with the truck bed and a truck leveler which raises or lowers the rear of the truck to index its bed with dock level. A modern safety switch development on the Trans-O-Matic Ramp will also be shown. This device automatically locks the ramp in a fixed position when the truck pulls away from the dock, thus preventing a sudden dip. A working miniature hydraulic bridge lift installation will show how plant or warehouse traffic can be routed across recessed rail tracks. *Globe Hoist Co. Booth 1106.*

**For more data circle No. 1 on postcard, p. 181**

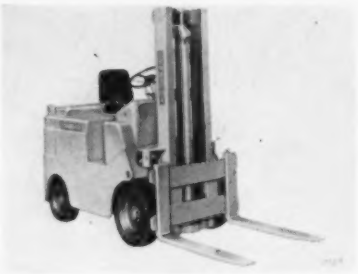
## Four new fork lifts

Four models in a new line of fork lift trucks offer a wide range of lifting capacities from 6000 to 11,000 lb. Gasoline, diesel and L-P Gas powered units are available.

Low cost power steering equipment encourages precision operation and improved load stacking efficiency. It can be ordered as an original or optional accessory, regardless of transmission, size of engine or capacity of truck selected.

A better automatic transmission responds to the operator's forward-or-reverse demands on a split second basis—with full automatic progression from a standstill to high speed. "Creep control" permits the operator to inch his truck slowly forward while maintaining maximum engine speed for lifting.

The "Pace-Maker" series for the first time includes (1) styling advances, (2) a functional body design for greater driving comfort and easier access to engine and parts, (3) improved maneuverability that contributes to truck balance, more positive operating control and dexterous load positioning, (4) longer life, (5) adjustable off-center seating to assure maximum visibility, and (6) new engines of increased power in gasoline, diesel or L-P gas powered models. The styling of the series is by a nationally known industrial designer, maker says. *Towmotor Corp. Booths 1112, 1206 and 1301.*



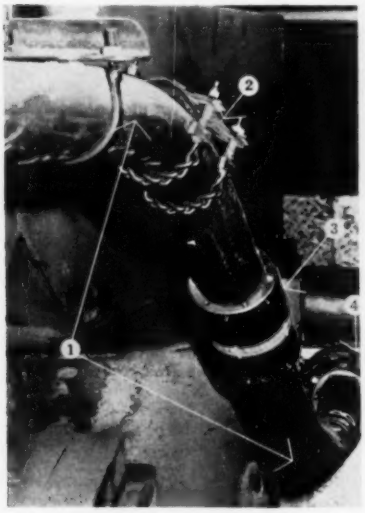
**For more data circle No. 2 on postcard, p. 181**

## Pipe moves solids

Pipe line transmission of sand and other solids now seems both practical and economical. Four new elements, used singly or in combination help make this so. The pneumatic sand transmission pipeline in a large modern automobile engine foundry shows how:

(1) Steel pipe bends are especially heat-treated and hardened for increased abrasion resistance and longer life.

(2) Special repair clamps with easy installation chain-type clamping bolts shut off leaks even on short-radius hardened pipe bends. These clamps cut system downtime to a minimum by keeping the pipe-



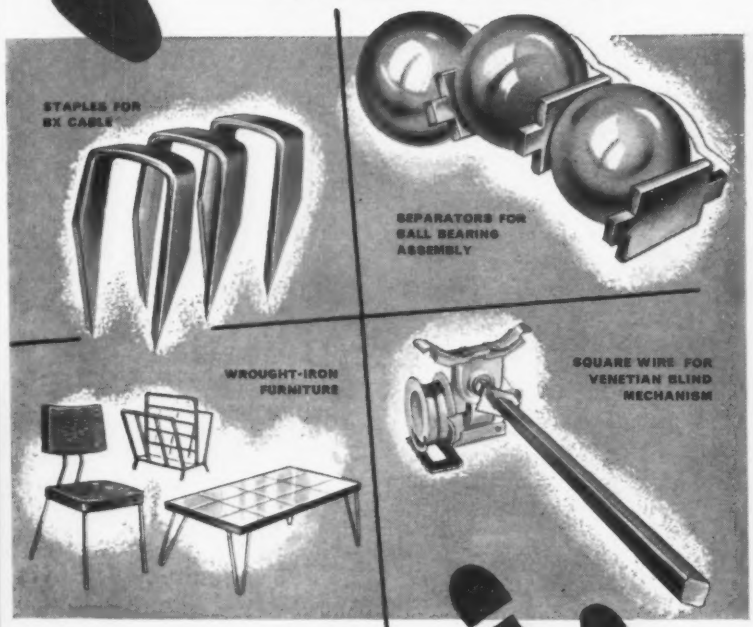

line in operation until the pipe can be replaced.

(3) Special couplings use plain-end pipe yet eliminate welding, threading or other special preparation. They slip on and off the pipe easily and can be reused again and again. This coupling has high plastic thread holding power under conditions of severe vibration, and includes shakeproof lockwashers and locknuts.

(4) Special flange combines a 150 lb ASA steel flange and one-half a special coupling. It joins previously installed piping where flanges are already in place. Like the special coupling, it slips off and on the pipe end. *The Pipeline Development Co.*

For more data circle No. 3 on postcard, p. 181


# CONTINENTAL®
# FLAT & SHAPED WIRE SAVES STEPS


STAPLES FOR BX CABLE
SEPARATORS FOR BALL BEARING ASSEMBLY
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**• IN A WIDE RANGE OF TEMPERS AND FINISHES**

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## Storage racks

Welded platform steel storage racks hold everything that can be stored effectively on a flat 42 by 48 in. pallet surface. As used by the new operations center of Tampa Electric Co. in Florida, they store almost $1 million of inventory in two aisles. The warehouse encloses some 3 acres under one roof.

Most racks are the general pallet type. Units quickly bolt into continuous rigid racks of the prescribed length, depth, and height.

The giant service depot has 15 ft

ceiling clearance and 78 in. wide aisles. Fourteen of the 300 men who work here move or direct goods in or out of place via these aisles.

Mechanized equipment includes a Yale Warehouser electric straddle truck, and two Clark Carloaders that work outdoors most of the time. Four-wheel hand trucks pick up stock from storage bins and racks, as well as unload high line maintenance equipment returned from each day's route in the utility's repair and service trucks. *Artco Corp. Booth A 1014.*

For more data circle No. 4 on postcard, p. 181

## New gasoline tractors

Two series of completely re-designed gas tractors are available. One series pulls 3000 or 4000 lb at the drawbar, depending on model. Another is designed in two capacities, rated at 4000 and 5000 lb drawbar.

Frame and body construction of the new tractors functions to permit clean lines, which eliminate snagging or hooking onto projecting objects. Welded frame, fenders and bumpers form an integral unit. Full spring suspension.

Hinged tractor head and engine side plates remove for complete and easy access to parts. All "under the hood" parts lie completely exposed for easy maintenance, wiring mounts on the front of the fire wall, beneath the hood and within easy

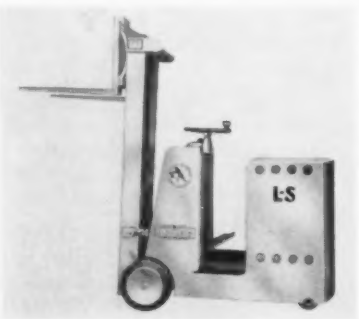
reach. Gas tank fills either the driver's seat or the rear of the tractor. Location of the gas tank, away from all wiring and engine parts, reduces fire hazard. *Mercury Mfg. Co. Booth 1003.*

For more data circle No. 5 on postcard, p. 181

## Electric fork lifts

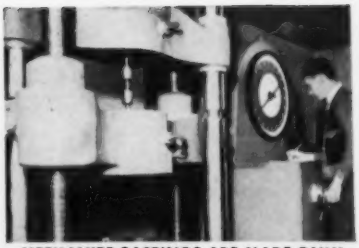
New, compact, maneuverable electric fork trucks move from 1000 to 4000 lb. They feature entirely new elevating assemblies, hydraulic systems, steering mechanisms and controls, as well as improvements in the brakes and drive axles.

The line promises more lift for a given collapsed height. New masts




make possible the claim. On 1000, 1500 and 2000 lb trucks, lift is 132 in. for 83 in. mast height. On 3000 and 4000 lb trucks, lift is 130 in. for 83 in. collapsed height. Both fork carriage and telescoping section ride on ball bearing rollers. *Lewis - Shepard Products, Inc. Booths 228 and 1012.*

For morte data circle No. 6 on postcard, p. 181

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Barnett Foundry & Machine Co., Irvington and Dover, N. J.
Blackmer Pump Co., Grand Rapids, Mich.
Compton Foundry, Compton, Calif.
Continental Gin Co., Birmingham, Ala.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
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Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machine Co., Inc., Cleveland, Ohio
General Foundry & Mfg. Co., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundry Co., Chicago, Ill.
The Hamilton Foundry & Machine Co., Hamilton, Ohio
Hardinge Company, Inc., New York, N. Y.
Hardinge Manufacturing Co., York, Pa.
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Koehring Co., Milwaukee, Wis.
Lincoln Foundry Corp., Los Angeles, Calif.
Palmyra Foundry Co., Inc., Palmyra, N. J.
The Henry Perkins Co., Bridgewater, Mass.
Pohlman Foundry Co., Inc., Buffalo, N. Y.
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Ross-Meehan Foundries, Chattanooga, Tenn.
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Vulcan Foundry Co., Oakland, Calif.
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Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario

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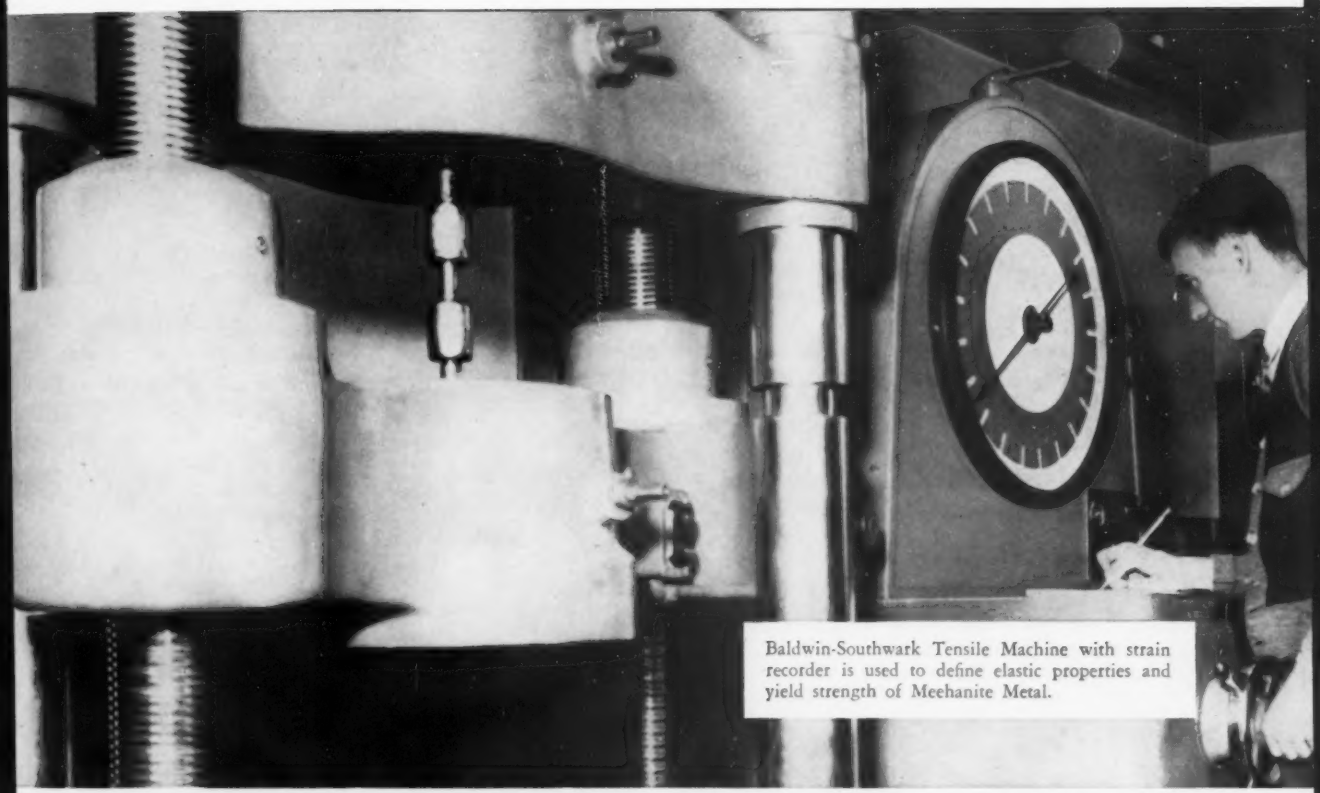
- **"PHYSICAL PROPERTIES OF MEEHANITE CASTINGS" BULLETIN NO. 32**
- **"MEEHANITE CASTINGS FOR PRESSURE TIGHTNESS" BULLETIN NO. 43**

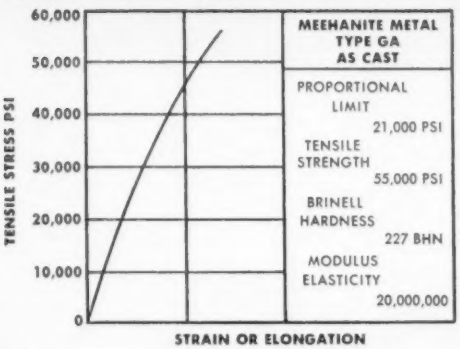
***Write today to Meehanite Metal Corporation, Dept. 1A, 714 North Avenue, New Rochelle, N. Y.***

**MEEHANITE®**



Baldwin-Southwark Tensile Machine with strain recorder is used to define elastic properties and yield strength of Meehanite Metal.

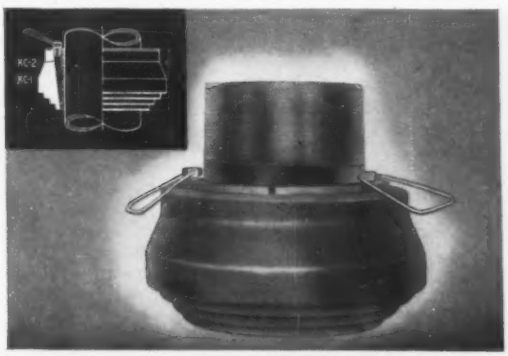
# MEEHANITE CASTINGS POSSESS TRUE ELASTIC PROPERTIES AND ARE MADE TO RIGID ENGINEERING SPECIFICATIONS




Meehanite Metal has a controlled microstructure, consisting of uniformly distributed graphite in a fully pearlitic matrix, which is comparable to that of a normalized spring or tool steel. This structure, the result of a unique manufacturing process based upon proven metallurgical techniques, assures good tensile properties in association with high yield strength and elastic modulus. These properties are of paramount importance in the selection of engineering materials since they aid in defining the useful characteristics of Meehanite Metal in service.

*For information, write today for Bulletin 32 — Physical Properties of Meehanite Castings — and Bulletin 43 — Meehanite Castings for Pressure Tightness.*

Power-Twin hydraulic pullers of 17½, 30 and 50 ton capacities manufactured with Meehanite ram body castings tested to 24,000 psi. The 30-ton unit needed an applied load of 87 tons before failure.




Meehanite casting support (KC-1) to hold tapered slips (KC-2) is subjected to downward pressures of up to 150,000 lbs. in oil well drilling. No evidence of failure under loads up to 210,000 lbs.

# MEEHANITE METAL®

**MEEHANITE METAL CORPORATION • NEW ROCHELLE • NEW YORK**

Another sign of freight-handling efficiency —

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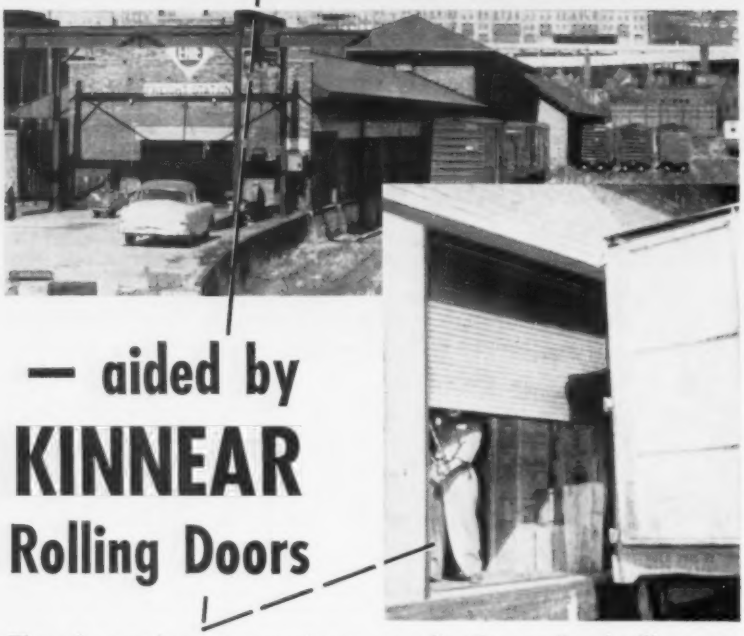

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Rolling Doors

Through more than 100 years of service, the Erie Railroad has kept pace with modern needs for quick, safe, low-cost freight-handling.

That's why, for many years, we've been glad to count the Erie among the many famous users of Kinnear Steel Rolling Doors.

Wherever goods, equipment, or rolling stock must be moved in and out of buildings—in any industrial or commercial activity—Kinnear Rolling Doors offer major advantages.

Opening straight upward, they coil *completely out of the way*, safe from damage. Whether opened, closed or in action, they permit full use of all surrounding floor, wall and ceiling space. Their rugged, all metal, heavily galvanized * construction stands up under long, hard use, through toughest weather conditions. Built any size, with manual or electric control, they are easily installed in old or new buildings of any type or construction.

Like the Erie, a majority of America's leading railroads use Kinnear Rolling Doors because they've proved to be a sound investment in long-lasting low-cost, carefree efficiency. *Write for the 1956 Kinnear catalog.*

*—with 1.25 ounces of pure zinc per sq. ft. of metal, ASTM standards.*

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KINNEAR

ROLLING DOORS

## Grab handles big rolls

Here's a giant hand that picks up rolls of paper, board stock, and the like, then piles them forty or more feet high in closely spaced stacks. The newly developed hydraulic roll grab avoids any need for space-consuming aisleways. It grips positively and handles rolls vertically or horizontally, and turns them from one position to the other.

The grab shown at the exposition twirls rolls weighing over 6000 lb. It accommodates rolls from 24 to 60 in. diam and from 36 to 84 in. long.

Other new ideas for materials handling include a manually-operated track switch. The heavy duty mite works smoothly by virtue of slide rod construction, and has a positive lock mechanism. This design permits easy replacement of wearing parts, including track sections. Hand-propelled track switches also may be motorized. Equipment is claimed trouble-free. *Cleveland Tramrail Div., Cleveland Crane and Eng. Co. Booth 216.*

For more data circle No. 7 on postcard, p. 181

## Motors

Motors designed for material handling equipment to be shown include hoist motors, gearmotors, and hydraulic pump motors. Two types of variable speed drives also will be exhibited. Typical applications of the various types of motors will be demonstrated, as will the complete equipment on which the motor is used. *Doerr Electric Corp. Booth 1435.*

For more data circle No. 8 on postcard, p. 181

J&L STEEL

# Sheets

Your particular requirements for uniformity in workability, formability and drawing properties guide every step in the production of J&L Sheet Steel.

Depend on J&L Sheet Steel to help you get the best out of your production equipment and add to the value of your finished product.

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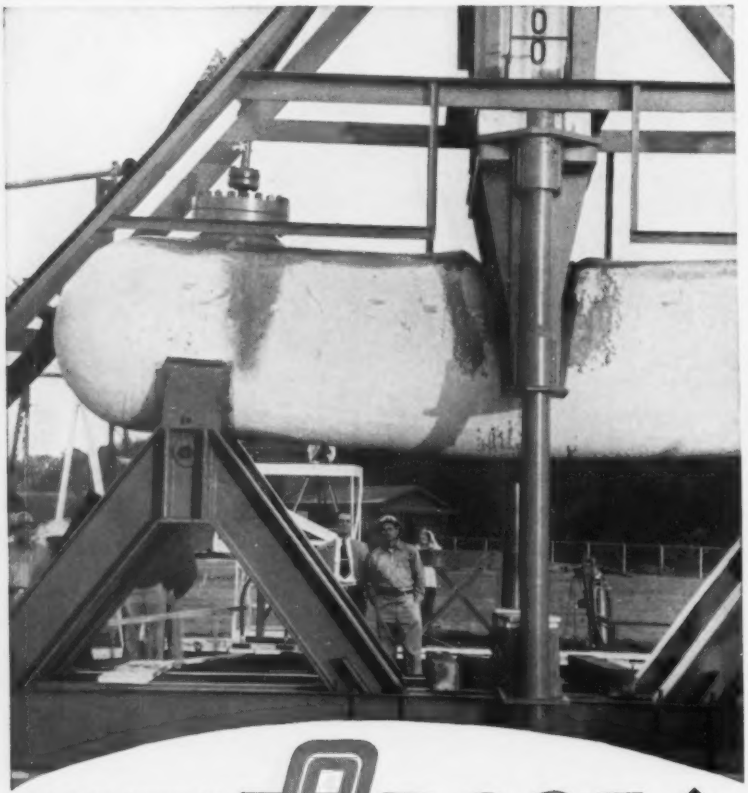
## Proof of how to weld Constructional Alloy steels for maximum strength

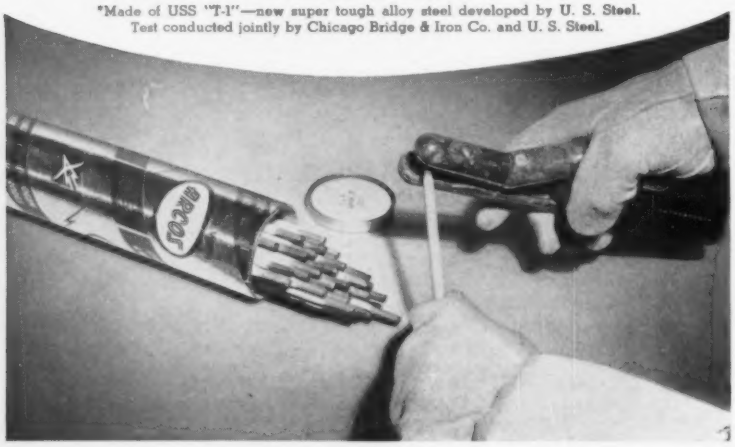


WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

The above test vessel* was welded with ARCOS Low Hydrogen Electrodes without stress relieving. After being refrigerated to —33°F, and pressurized to 1,875 p.s.i., a 13-ton ingot was dropped on it from 73 ft. All steel and welds remained intact—proof of how Arcos weld metal can meet the severest requirements of strength, low temperature impact, and pressure. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

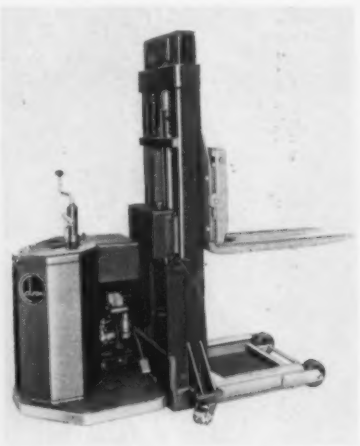
*Made of USS "T-1"—new super tough alloy steel developed by U. S. Steel. Test conducted jointly by Chicago Bridge & Iron Co. and U. S. Steel.





### High tiering truck

An engine-powered high tiering truck designed to operate in aisles as narrow as six feet is being introduced. The unit, which is the fourth in a firm's line of handlers, is available in capacities up to 4000 lb. Until now, the maker states, only battery-powered stackers have been available in this type. The handler stacker transmits the engine power for lifting and traveling with an all hydraulic drive, controlled by a single lever. Flow of oil to a hydraulic motor powering the drive wheel eliminates clutch, transmission and friction-type brake. An L-P gas system is optional to minimize fumes from the small 18 cu in. engine. A large muffler is used, while a hydraulic self-starter gives push-button starting. Lifting heights up to 15 ft are available. Understructures for skids or pallets, and various lead-bearing forks, grabs and arms are provided for different requirements. *Colson Corp. Booth 128.*



For more data circle No. 9 on postcard, p. 181

### Self-leveling dock

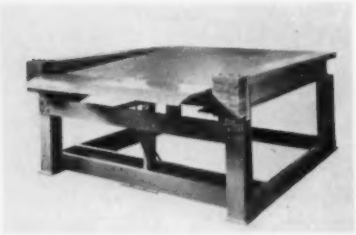
New packaged hydraulic dock leveling units support up to 10,000 and/or 20,000 lb, depending on model.

They are delivered completely assembled, ready for placement in front of an existing dock.

The 20,000 lb model is 6 ft wide and 8 2/3 ft long, front to back, it gives instant raising or lowering action, controlled from a push button station. A manual floating fea-

ture provides a smooth, level ramp which compensates automatically for spring deflection of the truck bed during freight transfer.

Each dock leveler has its own hydraulic drive unit, consisting of a ½ hp, totally enclosed, ball bearing motor, powered by 115/220, single-



phase, 60 cycle alternating current. The hydraulic package consists of a reservoir containing a pump, check valve, relief valve, and solenoid operated release valve, all mounted and assembled together as a self-contained unit. *Rowe Methods, Inc. Booth 301.*

**For more data circle No. 10 on postcard, p. 181**

## Low maintenance casters

New grease-sealed truck casters stand up against water, heat, or chemicals that harm standard casters. The design substantially reduces maintenance.

Case history stories illustrate how important proper caster selection is to production, engineering, purchasing and design personnel.

Floor truck locks with a new type Neoprene brake pad also will be seen at the show this year. One new floor truck lock features a 6 in. floor clearance. *Faultless Caster Corp. Booth 509.*

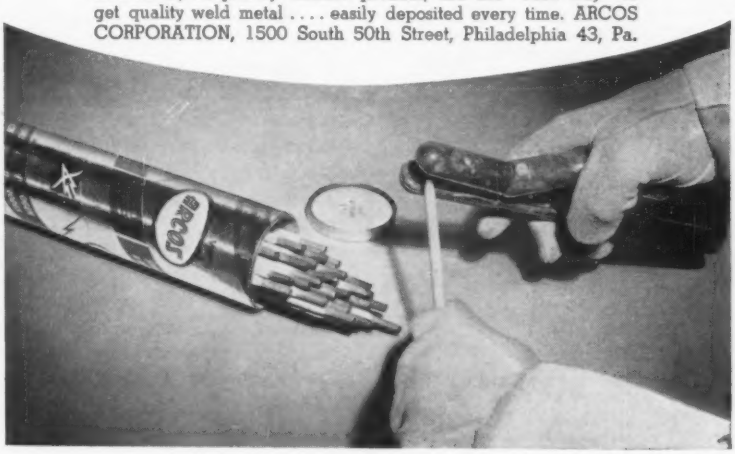
**For more data circle No. 11 on postcard, p. 181**


**A sure way to meet *every* demand when welding high strength steels**

**WELD WITH ARCOS**

**LOW HYDROGEN ELECTRODES**

Low hydrogen electrodes are no "stepchild" at Arcos. They're manufactured under the same high standards as stainless—to meet exacting conditions. For example, welds in a dipper that will chew out 45 cu. yds. of stony soil in one bite must be strong, and must resist abrasion, shock and fatigue. Where strength is of primary importance, Arcos ELECTROPAKED Low Hydrogen Electrodes, frequently without preheat, are the "sure way" to get quality weld metal .... easily deposited every time. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



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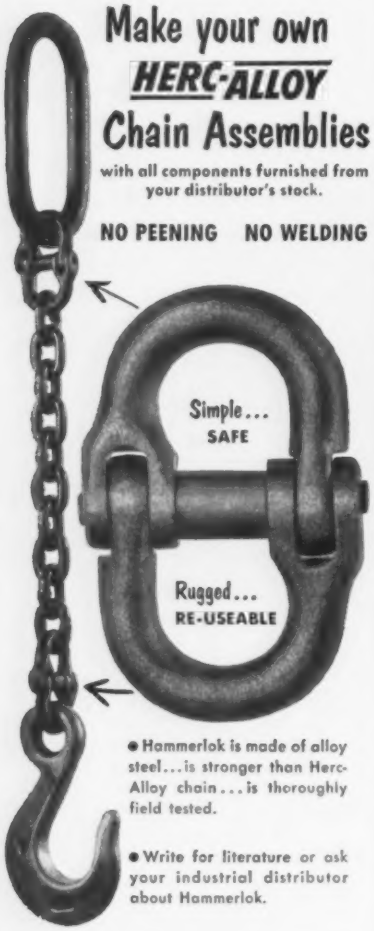


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## Rugged small crane

A new 100 lb hand-operated hydraulic crane lifts ¼ ton, yet mounts on the smallest capacity truck. The crane rotates a full circle in its well and locks at any of 12 positions.

The well mounts on top of the truck deck, braced to the chassis from below. It can be taken off its mountings by removing four bolts, leaving the truck deck completely

clear. The mast rotates in its well on a roller bearing. Two graphite-impregnated bushings brace it, insuring that the boom can be swung easily both loaded and unloaded.

One self-contained unit incorporates all hydraulics. This includes lifting cylinder, pump, release valve and overload relief, which is set at 700 pounds. The ¼ ton crane travels vertically 68 in. *Ruger Equipment, Inc. Booth 108.*

**For more data circle No. 12 on postcard, p. 181**

## Pallet and platform trucks

An all-new line of operator-led, electric-driven industrial trucks includes pallet models, high and low-lift platform trucks, high-lift suspended load type stackers and tractors. Recently innovated spring-loaded pawls hold the unloaded pallet firmly while the forks enter. This saves time and eliminates in most cases need for costly chamfering of end boards in double-faced pallets. Simple 3-point lubrication allows all load bearing surfaces to be regularly lubricated in seconds. This lubricates automatically by oil in the housing all moving parts in the all gear-driven power head, including the fully shielded ball bearing race, for smooth and easy steering. Compact design reduces aisle space requirements and helps maneuvering in tight quarters. New trucks measure only 21½ in. plus length of load, yet employ a standard 8¼ in. battery compartment.

New 3-speed Butterfly control permits the operator to inch his truck forward or back smoothly and precisely. This prevents too-fast starts, a safety advantage.

Drive wheel tires are changed in three minutes. The steel plate securing the wheel, when removed and reversed, becomes an effective wheel puller. *Automatic Transportation Co. Booths 1234 and 1332.*

**For more data circle No. 13 on postcard, p. 181**

## Battery chargers

A late development in battery charging equipment comprises a completely enclosed factory-assembled unit designed to J.I.C. standards. It is self-supporting and rigid enough to be moved without disassembly.

The bussed and wired unit consists of a motor-generator set, combination motor starter, generator control and the required number of charging controls. Only two simple connections install it. Seven steps now are necessary for present conventional battery charging equipment, it is claimed. An induction motor or a synchronous motor driven through a stand, open type 2- or 4-bearing coupling powers a compound-wound, shunt-wound or diverter-pole generator. *Electric Products Co. Booth 1427.*

**For more data circle No. 14 on postcard, p. 181**

## Electric train tractor

A new two-wheel, front steer electric tractor pulls a train of 3,000 lb. Main features include (1) rear seated operation, (2) full spring suspension, (3) automotive wheel-type steering, (4) unit-assembled double reduction drive,

(5) self-energizing, hydraulic brakes (6) 4-speed magnetic controller and (7) demountable wheel rim and tire assemblies.

Driver can couple and uncouple without leaving his seat. Full spring suspension cushions parts from road shocks and makes for more driver comfort. *Mercury Mfg. Co., Booth* 1003.

For more data circle No. 15 on postcard, p. 181

## Multiple valves

A new series of compact multiple valves meet the requirements of heavy duty material handling equipment. Standardized and interchangeable units assemble in combination to make up the series. Up to 8 sections can fit between special inlet and outlet units. The inlet section contains an integral relief valve. Sectionalized construction permits flexibility in assembly.

Demonstration panels also will show basic material handling motions that are hydraulically actuated and controlled. A two-dimensional working model of a typical material handling vehicle or device comprises each panel.

(1) A tilting platform for grain dumping uses a hydraulically actuated wheel stop, to control hopper door and dumping motions. (2) A lift truck fork tilts, raises and lowers hydraulically. (3) A mobile crane boom extends, rotates and tilts. (4) A front-end loader scoops and dumps hydraulically. (5) A truck dumps hydraulically. *Vickers, Inc. Booth 1415.*

For more data circle No. 16 on postcard, p. 181

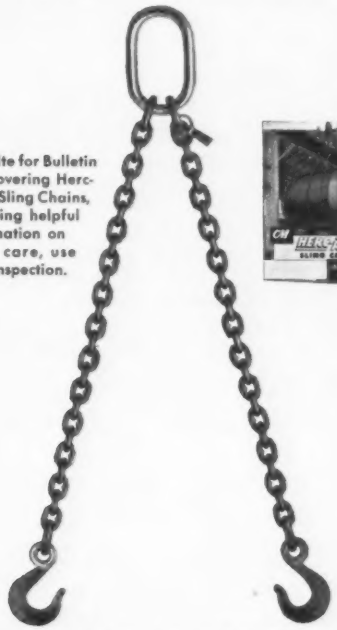
HERC-ALLOY

SLING CHAINS

● Herc-Alloy is the only exact-size alloy chain on the market. This uniformity gives you a lighter and easier-to-handle chain without any sacrifice in working load limit.

● Herc-Alloy, the original alloy steel chain, is available in running lengths as well as in all types and sizes of slings made to customer specifications.

● Write for Bulletin 100 covering Herc-Alloy Sling Chains, including helpful information on their care, use and inspection.



● CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.

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*in Lansing, Michigan*

4 out of 5 use

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STEEL SHOT

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WHEELABRATOR CORPORATION

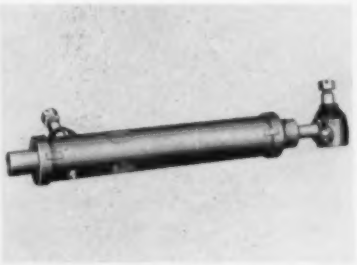
*World's Largest Manufacturer of Steel Abrasives*

510 South Byrkit St., Mishawaka, Indiana




## Steering booster

A new power steering booster intended specifically for smaller material handling vehicles attains low cost with simplified, streamlined double-tube construction. Material handling vehicles in the 4000 to 10,000 lb axle loading class employ the booster to best advantage.



The new design eliminates the need for tie rods. An external tube protects the inner operating cylinder and other working parts. The booster is available with 8½ or 10½ in. stroke. It operates at pressures up to 1000 psi. *Vickers, Inc. Booth 1415.*

For more data circle No. 17 on postcard, p. 181

## Lightweight hand crane

An easily maneuverable portable hand crane offers economical and efficient handling. With an open base to permit straddling, it is well adapted for die handling, maintenance or general shop work.

With a 250 lb capacity the crane lifts to a height of 5½ ft. Overall crane height 6 2/3 ft. Boom is 25 in. long.

Lightweight unit is equipped with 6 in. swivel casters on front and 7 in. rear wheels for easy maneuverability. A single foot-operated floor lock holds the crane in a stationary position. To both secure and release the operator simply steps on floorlock pedal. An arc-welded frame with tubular bracing provides high stability and rigidity.

A planetary gear winch loads cranks up and down and holds them at any point with positive safety. Aluminum crank handle swings out of the way when not in use. Direct cable pull is 600 lb. *Lewis-Shepard Products, Inc. Booths 228 and 1012.*

For more data circle No. 18 on postcard, p. 181

# The Engineer from Continental Screw Co. ...

## ...specializes in the service that your company must have

**The finest craftsmanship is worthless without prompt service**

Continental decided long ago to combine the highest level of craftsmanship with the most responsible kind of service. Here's what Continental means by service:

1. Continental offers you *24-hour service* on all standard fasteners. And Continental carries over 2,118,000 standard screw styles and sizes alone.
2. Continental offers you *national coverage*. Wherever your company is located, you will find a Continental supplier nearby to guarantee fast service.
3. Continental offers you the *latest and most complete IBM setup* in the industry. IBM machines handle inventory control, billing, and order writing, insuring prompt and accurate handling of your order.

If you need the right fasteners *at the right time*, get in touch with Continental. Our facilities are at your service.

**Only Continental Engineers Are Required To Have This Training**

Each engineer at Continental is required to undergo thorough experience producing ground thread taps and gages, with their exacting screw thread dimensions. This special training is passed on to you—at no extra cost.

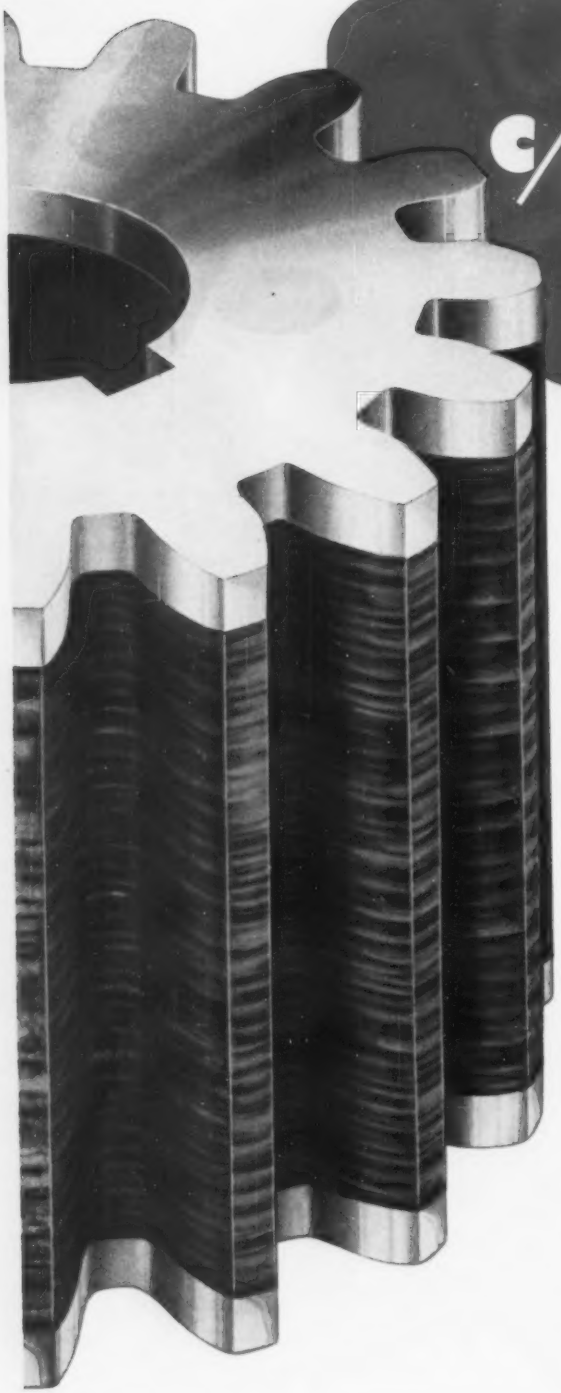
CONTINENTAL SCREW COMPANY INC. 1904

*—You can count on Continental.*

**Continental Screw Co.**

Manufacturers of Holtite Fastenings

New Bedford, Massachusetts, U.S.A.



# Do you know what C/R RAWHIDE GEARS can do for you?

**HERE'S WHAT**—They will transmit power quieter, with less vibration than other types of gears. These tough, resilient Rawhide gears will absorb momentary overloads up to 3 times their rated H.P. capacity . . . protecting expensive metal gears. Since C/R Rawhide pinions cause negligible wear, they actually prolong the life of mating metal gears.

**MORE FACTS**—They require no lubricant, are nonconductors, and are extremely durable. Rawhide spur gears are cut in sizes from 1″ O.D., ¾″ face up to 30″ O.D., 12″ face. D.P.'s range from 48″ to 1¼″; horsepower ratings go up to 50 H.P. or more. Where high temperature and humidity are factors, C/R gears cut from Nylon, Fabroil, Bakelite, or Micarta may be more suitable.

**ASK C/R**—We've been cutting non-metallic spur, helical and bevel gears for all types of applications for over 74 years. May we help solve your gear problem?

*Please write for illustrated C/R Gear Booklet.*

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THE IRON AGE | SPECIAL FEATURE

# HOW TO GET MORE FOR YOUR METALWORKING DOLLAR

Number 4 of a series

# MATERIAL HANDLING

*May 24, 1956*

# How To Get More For Your Handling Dollar

You'll find few more promising areas for cutting costs than in the handling of materials, parts and finished goods. Conservatively, it's estimated to account for 30¢ of every manufacturing dollar spent. Yet it's only in recent years that management has given handling any kind of systematic attention. Result has been fantastic increases in output for both old and new plants.

But many firms that want to improve their material handling on a systematic basis are often puzzled about where to dig in. This special feature combines—in one package—some of the best thinking of the experts on where to begin, how to solve specific plant problems, and what to consider in selecting and using various handling equipment.

Whether you're a one-man task force or a part of a larger team, you'll find this feature helpful in solving your handling problems.


| | |
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| **The Right Approach** | **P. 151** |
| **Analyzing Plant Problems** | **P. 154** |
| **Industrial Trucks** | **P. 157** |
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HOW TO GET MORE FOR YOUR HANDLING DOLLAR

1

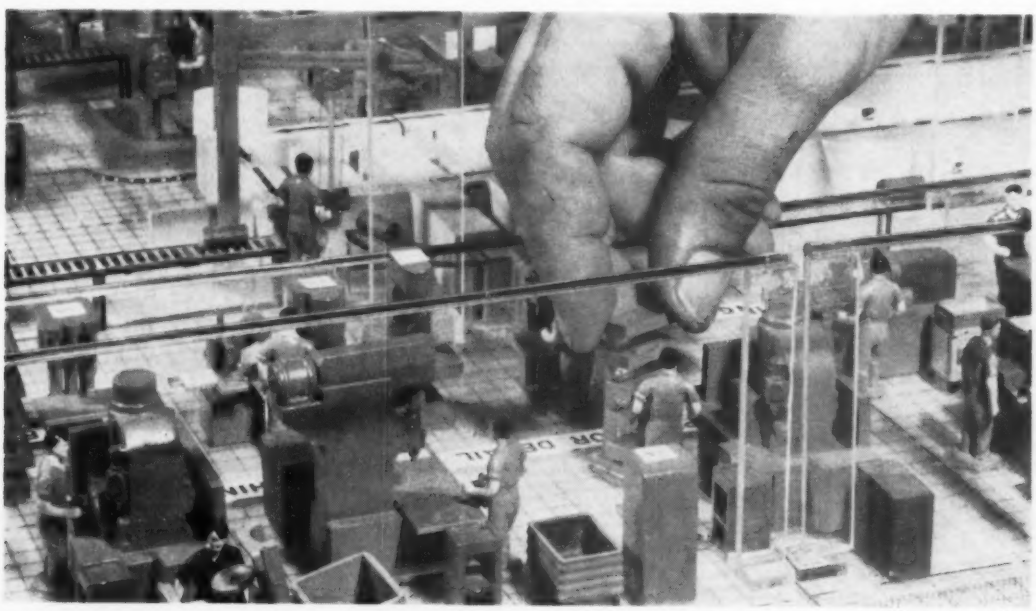
# The Right Approach

◆ YOUR COMPANY'S material handling problems are like nobody else's. Similar in many ways, yes—but not the same. Your recommendations will have to be tailored to the peculiarities of your own plant's problems. So a good first step is to study your overall operations.

Your aim here is to gain perspective on the many variables affecting the flow of materials and products into and through your plant. Many of them you won't be able to do anything about. But you'll want to consider such things as plant location with respect to raw materials and markets, your buildings, your general kind of manufacturing arrangements. You'll want to review your products, your particular manufacturing and service facilities — perhaps even your purchasing, engineering and sales practices, as they may affect materials handling problems.

So—get the overall view first. You won't recommend turning the place upside down. But it will help narrow your approach in tackling specific problems further along the line.

Start with location and buildings—but don't linger. Remember—you're looking for variables you can do something about, and the chances



Westinghouse Photo

**THREE-DIMENSIONAL layouts show the all-important height factor in plant arrangements, eliminating drawing board errors, facilitating approvals.**

**FLOW PROCESS CHART**

SUBJECT CHARTED
CHARTED BY
CHART NO. 1 – SHEET 1 OF 1
DATE
PLANT
DEPT.

GENERAL DATA

Skid pallet 48" x 30" for plant handling
366 tile per skid pallet
2189# per skid pallet
4000# capacity fork truck
Corr. paper expendable pallet
48" x 30" used for shipping and storage after gauging

SUMMARY

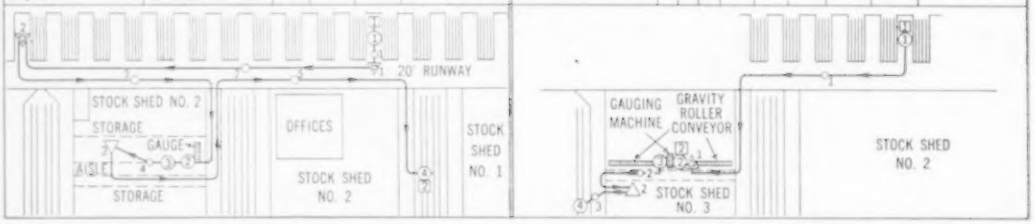
| METHOD | PRES. | PROP. | SAVE |
|---|---|---|---|
| No. of operations | 4 | 4 | 0 |
| No. of transportations | 5 | 3 | 2 |
| No. of storages | 3 | 2 | 1 |
| No. of inspections | 2 | 2 | 0 |
| Man hours | 58.75 | 46.10 | 12.65 |
| Distance traveled | 1066' | 280' | 786' |

**PRESENT METHOD**

| DESCRIPTION OF OPERATION | HDLG. | MOVE | INSP. | TEMP STOR. | PERM STOR. | MEN REQ'D | DIST. MOVED | TIME IN MIN. | EQUIP'T USED TO MOVE MATERIALS |
|---|---|---|---|---|---|---|---|---|---|
| Inspection | | | 1 | | | | | | |
| Place tile on pallet on dolly | 1 | | | | | 1 | | 9.40 | Manual Handling |
| Pull to aisle | | 1 | | | | 1 | 26' | 0.75 | 4-wheel dolly |
| Temporary storage | | | | 1 | | | | | |
| Move to temp. storage | | 2 | | | | 1 | 265' | 1.00 | Fork truck |
| Temporary storage | | | | 2 | | | | | |
| Move to gauging mach. | | 3 | | | | 1 | 210' | 0.70 | Fork truck |
| Gauge tile | | | 1 | | | 1 | | 17.10 | |
| Place on pallet | 2 | | | | | 1 | | 17.10 | Manual handling |
| Move to perm. storage | | 4 | | | | 1 | 65' | 0.45 | Fork truck |
| Permanent storage | | | | | 3 | | | | |
| Move to freight cars | | 5 | | | | 1 | 500' | 2.25 | Fork truck |
| Unload in freight cars | 3 | | | | | 1 | | 9.00 | Manual handling |
| Inspection | | | 2 | | | | | | |

**PROPOSED METHOD**

| DESCRIPTION OF OPERATION | HDLG. | MOVE | INSP. | TEMP STOR. | PERM STOR. | MEN REQ'D | DIST. MOVED | TIME IN MIN. | EQUIP'T USED TO MOVE MATERIALS |
|---|---|---|---|---|---|---|---|---|---|
| Inspect and place tile on pallet | 1 | | 1 | | | 1 | | 9.40 | Manual handling |
| Move to temp. storage at gauging machine | | 1 | | | | 1 | 140' | 1.00 | Fork truck |
| Temporary storage | | | | 1 | | | | | |
| Gauge tile | 2 | | | | | 1 | | 17.10 | Manual handling |
| Inspect and place on expendable pallet | 3 | | 2 | | | 1 | | 17.10 | Manual handling |
| Move to perm. storage | | 2 | | | | 1 | 100' | 0.50 | Fork truck |
| Permanent storage | | | | | 2 | | | | |
| Move to and load freight cars | 4 | 3 | | | | 1 | 40' | 1.00 | Fork truck |







The Material Handling Institute, Inc.

**FLOW PROCESS CHARTS, accompanied by simple flow diagram layouts, are helpful in analyzing present handling methods, proposing new ones.**

are nobody's writing blank checks for new construction. So acknowledge their limitations—then settle down to working within them.

Basic plant layout offers a more fruitful area. Experts agree, it's so interwoven with handling as to be all but inseparable in any study of the problems. Basically, which of the four general types of manufacturing arrangement are you? A job shop, making a large variety of low volume items? A progressive line setup, with more volume, less variety? A conveyorized line arrangement? Perhaps you're already a nearly or fully automated operation.

### Set up for movement

Whatever your overall kind of manufacturing arrangements (and they'll depend on the nature of your products) remember—they should be set up for movement as well as production: of raw materials, of parts and assemblies, of scrap where scrap is a problem. Bear in mind that your basic goal is to eliminate the need for handling operations wherever possible, and to mechanize as far as is practicable those handling operations you cannot eliminate.

With this in mind, ask yourself, are your basic arrangements the most practicable for your production requirements? Or could they be rearranged, integrated, somehow simplified or changed in sequence to eliminate the need for handling operations?

Can you upgrade your operations partially—say from a job shop to a progressive line setup? Upgrade a step higher on the scale towards automation and you'll speed production, reduce handling—cut costs.

Don't dismiss the possibility of upgrading too quickly. A recent General Electric study is illuminating on this score. It establishes that (a) 80 pct of most business's billing derives from 15 pct of their products, and, breaking down the 15 pct further, that (b) 80 pct of an individual product's costs fall on 15 pct of its parts and sub-assemblies.

What's the moral? Well, if GE's findings are generally applicable (and they believe they are), you may be able to break your business down into two logical groups of products or parts: (1) small variety, high volume items and, (2) large variety, low volume items.

Next step, clearly, is to consider mechanizing the high volume areas with an in-line product layout. It's this area where special purpose machinery and handling equipment of all



HOW TO GET MORE 2

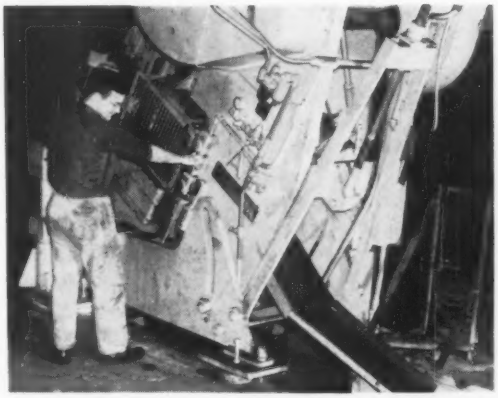
kinds can best be put to use.

There are several devices you'll find extremely helpful in analyzing plant problems.

First of these is the flow chart. This is all but essential as a tool for clearly defining the problem. It provides a simple means for collecting the data on your present material handling operation according to a practical plan. Used with a simple flow diagram layout, it enables you to make a step-by-step analysis and helps in turning up unnecessary operations, or ways to simplify handling.

Another sense in which it can be helpful, properly used, is in showing up where there are excessive time lags on material or parts between productive operations. Carrying inventory costs money—an estimated 10 pct of its original cost annually. If study suggests ways in which "idle" time of material between productive operations can be reduced, through modified layout or better control over bank of materials between operations, substantial economies may be effected.

Three-dimensional layouts are another valuable device. In laying out new facilities or in any extensive rearrangement of older areas, many experts consider them all but invaluable. The thoroughly detailed, three-dimensional models, utilized as a late stage in planning, show up height. Thus they can pinpoint costly errors which might otherwise be made on the drawing board. They're helpful too in getting necessary last minute suggestions and approvals from people who may be untrained in reading the conventionally used drawings.



General Electric Photo

**YOUR productive machinery can be utilized only as effectively as it can be fed and discharged.**

Another thing you'll need, as a basic "must" in any overall analysis, is accurate cost data.

This isn't easy to pin down where handling costs are concerned. Your flow charts, again, will probably prove your best tool in prying it loose from behind the half dozen cost categories behind which it's often concealed. Dig it out. You'll need it to realistically appraise how bad the overall problem is, to pinpoint more immediate problems, and to weigh the cost of handling ills against the proposed cures.

Well, so far so good. You've narrowed the overall problem. Plant location and buildings are adequate. Your basic manufacturing arrangements seem right for the products and problems generally. You can't see any immediate possibilities of upgrading operations. Cost studies have shown up the areas most needing closer handling-improvement study.

Now you're ready to get down to cases, analyzing immediate handling situations.

But first, a reminder. In analyzing any kind of handling problem, to make really worthwhile gains, you may have to rethink the operation, the machine, the product. This can carry you far beyond the immediate production situation. You may, for instance, want to ask Purchasing to investigate whether materials couldn't be delivered palletized or in some more easily handled (or better timed) form.

Or you may want to go back at your Engineering people, to say—'Look—if this design had a lug welded here, we could handle it with automatic equipment right through this operation, and save two extra handlings.'

There are other possibilities. The important thing, in any handling problem, is to use your ingenuity and every means available to eliminate the *need* for handling wherever it is economically practicable, before deciding. Well, since it must be handled, what's the safest, simplest, most economical way to do it?

Now—let's get down to specifics.

## GUIDES TO GOOD HANDLING:

**1. Perform only absolutely necessary operations.**
**2. Determine best methods, consistent with overall requirements of the operation.**
**3. Reduce amount of handling by production workers.**
**4. Synchronize related production operations.**
**5. Avoid needless transfers of material.**
**6. Avoid sorting material wherever possible.**
**7. Utilize packaging, containers, and unit loading to facilitate mechanized handling.**
**8. Use mechanical aids to more fully utilize men and equipment.**
**9. Schedule and control to get the right material to the right place at the right time.**

# Analyzing Plant Problems

◆ YOU'VE WHITTLED your overall problem down to workable size now. You know your major limiting factors, have your overall operational needs and arrangements firmly in mind —have brought other areas deserving further analysis into sharper focus. Now—with a plantful of possibilities before you—where do you dig in?

There are several approaches open.

For purposes of simplicity, you might want to follow the three-way breakdown of Receiving — Production — Shipping, since handling clearly involves the movement of materials and products into the plant, through the plant, between plants, out of plants and the storage of these materials and products at each movement. Or you may decide just to begin with the areas most transparently in need of improvement, as indicated by excessive worker fatigue, way-out-of-line costs, safety hazards attributable to handling, work slowdowns, etc.

Wherever you decide to dig in, you'll want to bear the suggestions in section one in mind (scaled down to the size of the situation), and to supplement them with as much additional handling knowledge as you can acquire. West-

## Set Up Your Handling System By:

**1. Selecting the general method and kind of equipmnt to do the job. For instance, policy or experience may suggest a conveyor system, a truck-container system, a crane system, or a combination of these general methods. Although it may appear extremely arbitrary to select the method first, it is really necessary to have some basis for calculating the amount of handling work required.**

**2. Determining amount of work to be done —the work volume—in units appropriate to the type of equipment. The data developed may suggest a change in the method selected in step one. But without this information you can't determine intelligently whether the original selection of method was good or poor.**

**3. Determining specifications for, and quantities of handling equipment and facilities required. General method, nature and amount of work to be done, and conditions under which it is to be done are considerations in this step.**

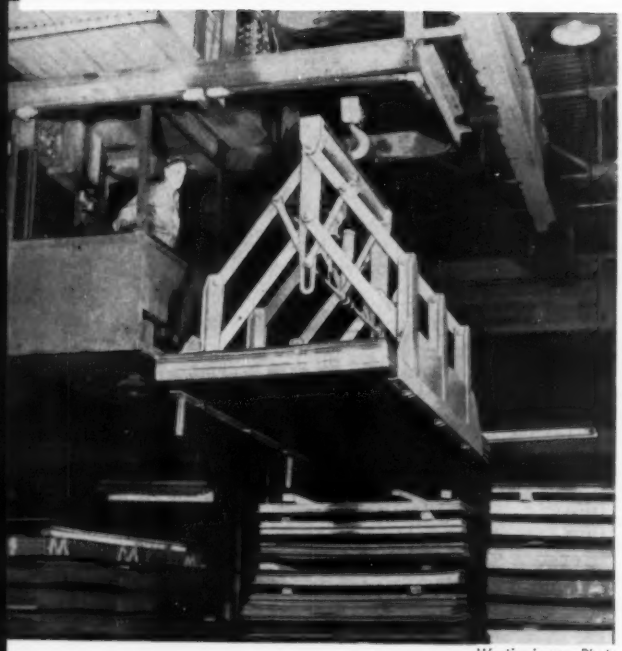
**4. Determining placement of equipment, arrangement of facilities, and the requirements for personnel and controls.**

The Materials Handling Institute, Inc.



**These conditions suggest**

skids—they should be of the expendable or the



Westinghouse Photo

**THE MOTION needs of the material to be moved will help determine the kind of equipment to use.**

inghouse Electric says flatly that a good handling man will return 10 times his cost the first year alone.

Your own effectiveness in handling will depend on two things: (1) your knowledge of the handling tools, data and analytical methods used, and (2) your ability to apply them to specific handling situations.

### First define the problem

Begin your analysis by clearly defining the immediate problem. Your best tools, again, will be a questioning attitude and a judicious use of the flow chart—there's no better tool for studying the problem step by step. Ask yourself, at each stage—How did the material get here? Where does it go next? Is this move necessary, or could we regroup machines somehow for a better work flow? And always, where handling seems absolutely unavoidable—Would some other method cut hand labor, reduce fatigue, increase production, speed flow?

It's important to start at the beginning of the cycle or operation under study, because you'll again need a good mental picture of the overall situation. This to avoid recommending handling changes which may help locally, but which might raise additional problems in areas outside the immediate stage under study.

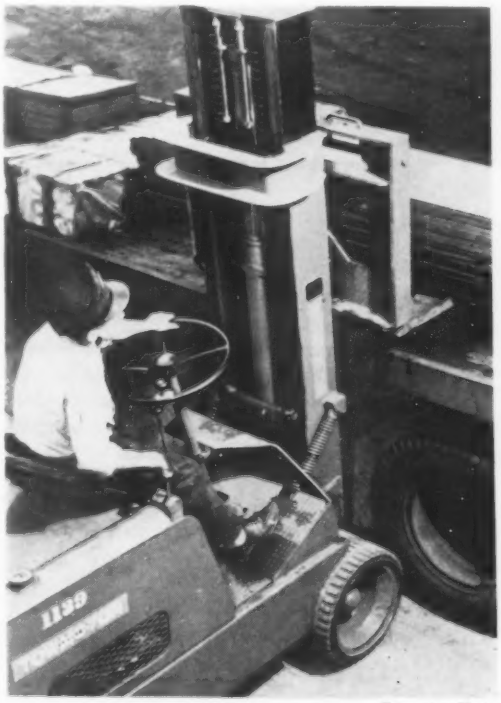
A word of warning, though, in ferreting out faults in handling methods. Just as important as learning to recognize what is a handling problem is learning to recognize what is not a handling problem, but what at first glance might be mistaken for one.

An excellent example is that of a large plant warehouse facility of a major manufacturer. The plant sent company headquarters an urgent request for approval of a $300,000 conveyor arrangement to ease a shipping bind. Headquarters, before approving the request, looked into the problem. They found the real source of the trouble was the variety of color and model combinations of the units shipped, and the necessity for making up mixed carloads in irregular lots. In short, a problem better approached through production scheduling than through elaborate handling measures.

In considering receiving problems, you'll want to ask such questions as:

Are you unloading incoming materials by hand? How many times must you handle them from receiving dock to start of production? Are units of proper size for easy and economical handling? Another question—in handling materials from receiving dock to first stage of production, can weight control be installed as an integral part of the system? Are you receiving materials in one form and having to handle before using them in another form?

Consider, too, whether the receiving container is suitable for shipping the end-product. Are your men sitting around waiting for ship-



Towmotor Photo

**BEST MATERIAL handling setups coordinate strong features of various handling equipments into an integrated overall system.**



HOW TO GET MORE FOR YOUR 3

**These conditions suggest there may be room for handling improvements:**

---

**1) When the same type of material is handled daily in a given area, particularly over the same route or path.**

**2) Where it is occasionally (but infrequently) necessary to handle the same type of materials in large quantities.**

**3) When one or more employees must move quantities of materials 50 ft or more.**

**4) When productive operators must interrupt work to move material, get supplies.**

**5) When male operators must lift materials weighing over 75 lb, or females over 35 lb, as a customary operation.**

**6) When materials that can be moved in unit loads are placed on the floor, rather than on a pallet, skid or other type of support, requiring manual handling when needed.**

ments to find them? How can gravity help you in moving materials around?

Production areas offer particularly large opportunities for improvement. Handling on the shop floor while work is in progress has been estimated to account for 75 pct of all materials handling costs in a plant, with storage and shipping eating up the other 25 pct. Some of the questions you'll want to answer here, after considering such physical limitations as floor load capacity, aisle space, elevators, etc., are:

Do skilled workers handle heavy materials? Is straight line production that eliminates back hauls in use? Must materials be placed at a distance from machines using them, because of aisles too narrow for trucks, for example? Are delicate parts frequently damaged in transit, and would rubber-tired trucks be an improvement? Is scrap disposed of promptly? You'll want to know, if skids and pallets are indicated—can they be carried through to the end of production? Does storage of parts in process add appreciably to handling costs? These are some of the dozens of points you'll wish to question.

In shipping, you'll want to know how the finished product is sent out (truck, rail, etc.), how the receiver wants it for best handling at his end, and whether — if products can be loaded, warehoused, handled and shipped on skids—they should be of the expendable or the returnable variety.

Such analyses can be particularly rewarding if your plant—suffering from an overstuffed feeling — has been toying with the thought of adding new capacity.

Often, handling improvement programs will permit fuller utilization of existing machinery and space to accommodate the added traffic. One major metals firm, for instance, about to burst for lack of storage capacity, found that a timed conveyor system which produced a more even flow of materials through processing operations so stepped up and smoothed out inventory turnover as to end the problem.

In selecting the particular kind of equipment (conveyor, forklift, crane, etc.) to meet a handling requirement, the movement needs of the material and obvious physical characteristics of buildings will be limitations. Circumstances will suggest others. Common sense ordinarily will limit you too — you won't want a gantry where a chain hoist will do, or a power conveyor where a gravity conveyor will serve. Let common sense help suggest the simplest solution—but then don't be hogtied by it.

A major electrical firm advises, for instance, that you never buy handling equipment with just handling alone in mind. Consider subsidiary values. One company finds powered conveyors ideal for controlling its bank of inventory between operations. Another uses overhead conveyors for out-of-the-way cooling of parts emerging from ovens, for running several-hour-long tests of motors, etc.

### Mechanize on program basis

Where possible, try to mechanize on a planned program basis, most-easily-made improvements first, with primary concentration on improved use of existing equipment, plant and storage space and personnel.

Just as you will want to work with the operating people in the areas concerned in studying operations and making your analyses, so its a good idea to call in your competitive equipment suppliers. They are broadly experienced on all kinds of handling problems, and can offer extremely helpful suggestions and advice. One major machine tool firm, after working up improved material handling methods, had suppliers bring their equipments in.

Demonstrations made were filmed, together with existing ways of handling. This film documentation was then supplemented by a short report on savings and costs and used as the basis for selling management on a $200,000 handling improvement program.

Other determinants in selecting specific equipment will be past experience, the availability of service in the area of the plant, and such associated matters as probable maintenance problems, operator training required.

# Industrial Trucks

◆ YOUR ANALYSIS SUGGESTS trucks as the best answer to a particular handling problem. But—whose trucks? And in what capacity, size and weight, general type (platform, forklift, tractor?), and kind of motive power? What are the important factors to consider?

Well, industrial truck manufacturers supply an amazing variety of equipment and attachments, for an amazing variety of applications. Your suppliers can be a big help, not only in helping you decide on the details of what equipment you'll need, but in suggesting, on the basis of their many years' experience with just your kind of problems, ways in which you might set up an even better truck handling system for your operations.

So if you haven't already, you'll certainly want to talk to your suppliers. But here are some of the things you'll need to know.

### Meet your average needs

First of all, it's good sense to pick equipment that will meet your day-in, day-out average requirements. It may be that you have an occasional heavier load to be lugged, or to be stacked higher—but don't buy with the occasional outsized job in mind. Figure another way to handle that one, unless you're prepared to pay the higher initial cost and the higher operating cost that the largely-unneeded extra capacity is bound to entail.

Rule one, then, is don't try to buy your truck to be all things for all situations.

The same analysis which led you to a "trucks" decision will have laid out for you what your truck capacity requirements are, in terms of length of hauls, size and type of loads, lifting to be done, etc. This will help you in deciding general kind of truck. If its forklifts you need, for instance (and they make up better than 50 pct of all industrial trucks sold), they can be had with gasoline, gas-electric, electric, or diesel power units.

Clark Equipment Photo

**Variety of attachments are available to adapt truck to your special needs.**

There are good applications for each—choice will depend on your circumstances. Electrics are preferred by many plants for short haul, heavy lift inside duty; gas for longer hauls where there is plenty of air space, where heavy ramp work is a factor, or where pneumatic tires would be an asset.

Propane-fueled trucks (conversions from gasoline run an estimated $200 to $300) are finding wider use. Factors here are elimination of fumes, high efficiency, improved engine life, reduced fuel cost per hour. Bottled gas is sometimes bought in bulk and stored for maximum economy.

Electric trucks hold the advantage for many companies because of lower maintenance, lower operating costs and longer life. Gasoline trucks hold an initial advantage of lower cost, are good all-around workers, and may be better adapted to certain types of operations; for instance, where trucks might be in heavy, almost continuous operation for several days, then have long, light duty respites.

Whatever you decide on, in terms of capacity, you'll want to leave an extra margin to allow for immediately foreseeable needs. If you're streamlining your handling techniques to permit, for instance, carrying two palletized units where before you carried singly, by all means buy the larger truck to permit switching over to the more efficient system.

In choosing fork trucks, lift is, of course, another consideration. Practicable stacking limits will depend on (1) ceiling height, (2) how much total load weight the floors will take and (3) the maximum weight the bottom load layer will take.

Pick your truck for proper lift by determining the greatest stacking height you'll need, then subtracting height of one layer. Bear in mind, though—where extra high stacking is required—that telescoping forklifts generally increase collapsed height of the truck one inch for every two inches of added reach. You'll want to guard against boxing yourself in by specifying a truck which won't pass through some of your doorways, into elevators, or into highway or rail carriers where these may enter the picture.

Baker-Raulang Photo

**Forkless attachment permits stacking cartons without need for palletizing; permits working in closer quarters than forks would allow.**

Total weight and size of your truck will be limited by floor loading capacity in plant areas where the truck will be used, elevator capacity and aisle widths. And you'll have to figure floor loading in terms of "live" loads.

This, truck experts advise, means allowing a 50 pct safety margin over the weight of the truck with maximum load standing still.

There are ways around some of these limitations. Some companies, for example, skirt the elevator problem by riding loads and truck separately, or by using lighter kinds of trucks for elevator, narrow-aisle and upper-floor work. This leaves heavier, faster vehicles to work main aisles and floors. Powered platform trucks are especially useful sometimes in such situations. They can often work areas fork trucks can't because their basic design distributes their weight over more floor area.

Forklifts are, of course, best where stacking is an important factor. If pulling or carrying over a distance is the basic problem, platform trucks or tractor-trailers may be a better bet.

Location of truck controls and working position of the operator are also worth taking into account. Most users of fork trucks under 10,000 lb prefer center control sitdown types. Where standup types are preferred, reasoning is that operators are kept more alert and can move on or off trucks more quickly.

### Choosing a battery

Battery requirements are another decision you'll have to make if electric trucks are your choice. Here you'll have to determine the work requirements—lengths and frequency of travel during a normal work day, number and height of lifts required, action of any attachments, stops and starts, amount of jockeying required, sharpness of ramps, etc.

Battery truck users are showing considerable interest today in big, often special, long-life batteries. This is in line with the trend to larger capacity, greater range, more flexible equipment.

You'll be thinking about attachments, too. There are a score or more of standard attachments available—sideshifters, rotators, scoops, booms, barrel lifts, etc. They extend the versatility of the basic truck amazingly. It's important here for you to find out just what kinds of attachments are available and the proper uses for each in planning your system.

For a price, you can get about what you want in the way of special attachments, too, and such special attachments are coming in for increasing attention. One user has an attachment that picks up four drums at a time; another uses a special



HOW TO GET MORE

## CHECKLIST
## for Industrial Truck Buyers

**You'll find it worthwhile to go over this list with truck manufacturer's representatives. From wide experience they know the best truck features for your handling jobs.**

### Capacity

- ☐ Size and weight of loads most often handled
- ☐ Possible increased load size and weight

### Lift

- ☐ Greatest stacking height feasible minus height of one complete load unit
- ☐ Allowable collapsed height of truck
- ☐ Maximum weight withstood by bottom load in the stack
- ☐ Maximum weight withstood by floor
- ☐ Maximum stability of truck during high stacking

### Total Weight & Size

- ☐ Floor load capacities
- ☐ Elevator capacity and size
- ☐ Aisle widths
- ☐ Limitations of confined areas
- ☐ Floor capacities of commercial carriers

fork which permits picking up loose material in 1000 lb packages, instead of in individual drums as formerly.

And don't overlook forkless attachments. Where applications permit their use, these can be most useful. A combination finger lift and carton lip attachment, for instance handles either wirebound crates or cartons of the cap-and-tube type without the need for pallets. This saves weight and space, and since forks aren't required, means that trucks require less elbow-room to maneuver for tight-quarters handling.

Whether you'll want to buy or lease trucks, again, will depend on your circumstances. Most makers offer some sort of leasing arrangements If you don't want to tie up your capital, you might want to look into this arrangement.

Details of lease arrangements vary. One firm offers a straight 3- or 5-year lease plan, with option to buy by several methods. The plan takes tax considerations into account; leaves costs of maintenance, insurance, taxes, etc., to be paid by the user, apart from lease payments.

Scheduling systems for your trucks and maintenance are factors you'll also want to take into account before purchasing equipment. Your deliberations won't be premature—you'll have to have a pretty good idea in order to help decide how much equipment you'll need and what makes you'll want to get.

Maintenance programs range all over the map. Some companies have a simple "when it busts we fix it" philosophy, and make even routine lubrication an extremely haphazard affair. Others have very elaborate maintenance programs, including regular periodic inspections and maintenance and full authority given to maintenance people to pull trucks out of production when they feel it necessary to do so.

### Good lubrication pays

Recognize the importance of instituting an effective maintenance program. The average forklift costs as much or more than a Cadillac, and its only common sense to take care of it. Sound lubrication practices alone, one large firm estimates, can add 15 to 20 pct to truck life.

Keeping adequate and complete records will help a lot. One major electrical firm keeps simple card records on its more than 300 trucks of all kinds, both for lubrication and maintenance and for periodic review to track down causes of recurring maintenance problems.

The same firm, incidentally, reports that centralizing six truck-parts storerooms formerly scattered around the plant resulted in a 25 pct cost saving. Surplus spare parts requirements were simplified, personnel requirements were less, and studies showed that parts for different kinds of trucks were sometimes interchangeable.

Operator training also should have maintenance overtones.

Reason for this is that an operator trained to spot danger signs of truck behavior can be a great help in preventive maintenance. Where possible, it may be advisable to assign the same operator to the same truck permanently. He'll get the feel of it better, and the pride of ownership factor may work in your favor so he'll take better care of it than he might one taken at random from a group.

Scheduling considerations will depend on your plant. If you can throw a rock and hit your driver anywhere in the place, you obviously don't need elaborate telephone or radio dispatching systems. Your driver will probably follow a routine of visiting each department in rotation.

Two-way radio systems are proving extremely useful in large plants in minimizing deadheading or empty runs and time required to check in, by other means, to dispatchers. One auto plant reports a 30 pct step-up in efficiency of trucks since installing a radio-telephone system.

# Conveyors

◆ CONVEYORS will do jobs for you that manpower alone won't do, or which—at best—must be done under extremely difficult, hazardous, tedious and time-consuming conditions. They'll move things through furnaces and freezing temperatures, through acids and paints, through toxic atmospheres and dust — seven days a week, 24 hours a day. And they'll do these things without getting a broken toe or a hernia.

So if your need to move sufficient volume of material over a fairly fixed route has decided you on conveyors, you've made a good choice. Now—how do you go about deciding which kind will serve you best?

Your best bet again is to talk to a conveyor engineer, if you haven't already.

Naturally, no specific recommendations can be given to fit all your conditions of handling. Each installation must resolve a range of variables. But for the most part you can get a good idea of the kind of system you'll need from the motion needs of the material, the kind and volume of the material, the physical limitations of the plant (which may lead you to an under-the-floor or overhead type, if quarters

Hewitt-Robins Photo

Conveyors are ideal for bulk handling of ore and other materials, for short or long hauls.

are cramped), and the subsidiary benefits you want to realize.

These latter might, for instance, include the advantages of overhead cooling, test-running, or temporary storage of materials, parts or products. Or again, they might stem from your ability to mechanically pace the bank of materials between operations through powered conveyors, or to run materials right through processing and machining stages.

Industrial experience generally shows that in the majority of installations it is usually more economical, in the long run, to engineer the conveyor especially for the job. Usually you'll find the increased production, better flexibility and improved performance will offset any increased cost as compared with a standard installation.

### Overhead vs Floor Types

There are, of course, excellent applications for all kinds of conveyors offered. Latest floor-type models usually offer some advantages with respect to rigidity. If under-the-floor types are used, restrictions on floor movements of materials are minimized, but there are often other limitations.

Overhead types, on the other hand, get materials out of the way with a minimum of interference with the operating floor. Flexibility of overhead systems is outstanding.

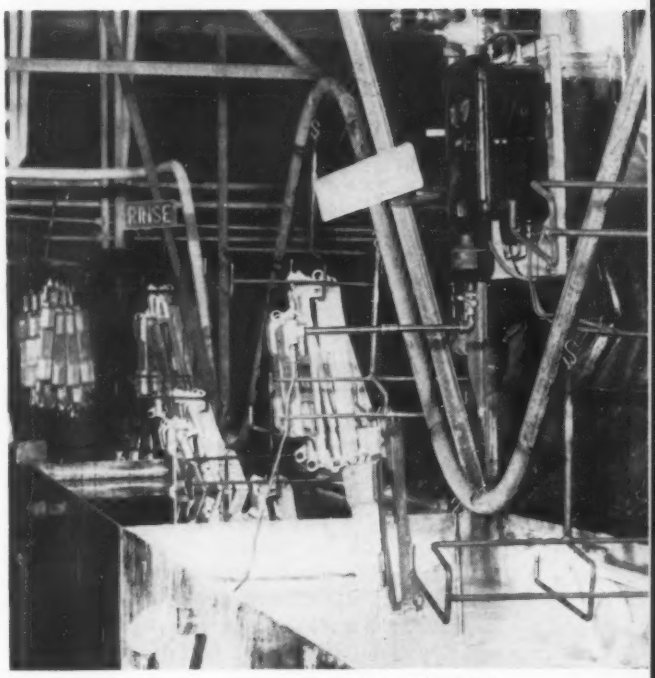
Where volume or other considerations justify its use, you may want to consider the power-and-free conveyor. This is an overhead system which can dispatch carriers automatically to any work area. Carriers may travel diverse paths, switching and transferring carriages between production lines for storage, inspection or other purposes.

Many plating conveyors are classic examples of built-in versatility. Once parts are loaded into a basket or barrel, nothing more needs doing until parts are ready for unloading. Rinsing, cleaning and plating are timed precisely. Certain baths may be skipped automatically. Cycling of work loads can be varied from one carrier to the next. In smaller models, these are ideal for job shop operations.

Perhaps your conditions make you a prospect for one of the portable type conveyors. Skip hoists are an example. Another is a pedestal type which can be wheeled into a paint room. When the paint job is completed, it's simply wheeled back to the production line. The 20-lb. long unit has a variable-speed power drive mounted at one end.

Perhaps your loads are very light. For such applications, and where tooling amortization period is short, a Chain-veyor may provide an adequate flow of materials. This consists of a chain which moves inside a slotted tube. Carrier trays may be attached to the chain.

Installing conveyors with flexibility in mind can be helpful, too. A west coast stamping firm, for example, suspended its conveyor system on easily-removed welded brackets, greatly simplifying later rearrangement. The same firm, incidentally, color-coded its conveyor buckets as a simple means of differentiating between right- and left-hand stampings.



AC Spark Plug Photo

**Ability to handle parts or materials right through processing operations is an important characteristic of conveyors.**

Where more or less conventional conveyors are the answer, you can sometimes realize important savings by sticking to an equipment that is precisely adapted to the application. You might wish, for example, to standardize on one size by using only 3 in. conveyors throughout the plant. Best economy, however—in terms of initial installation cost, space required, and operating costs—may lie in the direction of using several sizes.

A recent automobile-industry innovation which may be adaptable to other plants is the stop-and-go assembly conveyor. This ties in a floor conveyor with an overhead conveyor which supplies such engine parts as nuts, bolts, caps, screws and gaskets to the assembly line.

Whatever kind of conveyors you select, you'll want to set up regular greasing schedules. Automatic Alemite systems are very effective. Another method used for lubricating conveyors is oil mist. This lubricates chain, trolleys and drive continuously, and stops when the conveyor stops.

# Palletizing

◆ PALLETIZING and packaging take a sizeable chunk of your handling dollar. Some plants spend more than $1 million annually for wood and metal pallets, cartons, paper bags and other packaging aids. Even the smallest metal-working plants spend many thousands for these items.

As large as this expense may be, there's a proportionately large area for shaving this figure down. In fact, it's such a fertile area for cost-cutting that it'll pay you to recommend calling in the best engineering and packaging experts to lay out a comprehensive palletizing program.

Before embarking on such a program, however, check as to what has to be moved where and when. If you're moving occasional lightweight loads over short distances, you're probably a good customer for something other than pallets. Same holds true if you're handling scrambled or limited sizes of packages over a fixed route.

### Where will palletization pay?

As a general rule, the more you increase amount and weight of goods handled, distance and frequency of handling, and the more variability there is in handling routes, the better prospect you become for a palletization program.

Directly and indirectly, you stand to gain in a dozen different ways from such a program. You can figure on cutting handling costs by 28 to 80 pct, depending on the type of product, rate of production, etc. Consider, too, the saving in converting dead air space into valuable storage space.

But palletization goes much further. It'll often make the difference between paying overtime and eliminating it entirely, or at least reducing it drastically. It'll simplify inventorying, cut down on accidents, eliminate cluttered areas, make housekeeping easier and reduce damage to goods. If pilferage has been your problem, unitized loads in palleting will tend to discourage it.

Perhaps your fees to carriers seem excessive. If so, palletization will help to cut down loading and unloading time. You'll also make better use of carrier space and rid yourself of unnecessary demurrage charges.

Size, shape and weight of parts being handled will undoubtedly influence pallet selection.

Whether wood or metal pallets are best usually cannot be determined on the basis of work volume alone. Some very large plants, after examining handling costs carefully, still favor wood pallets. Other large plants, equally cost conscious, lean toward metal pallets.

Before recommending pallets for your own plant, consider how they will affect your vendor. Pallets that'll do a fine handling job in your plant may place an extra burden on him. The extra charges may offset your gains. Study handling costs carefully right from the vendor's shipping dock to your customer's door.

Getting wood pallets of a small size may cut initial costs. But don't count this as a saving if you ship by truck or rail. Chances are you'll pay this out in the cost for extra blocking.

Before deciding whether to "make or buy" wood pallets, analyze the cost figures carefully. Experience of some large users shows that buying is best for them.

Standardization and development of unit loads are other areas of potential economy. It may be possible for you to buy pallets best suited to the job just about as cheaply as standard size pallets. Examine every angle, buy standard sizes whenever practicable and constantly try to build up a unit load or package.

And once you get them, take care of pallets. Frequent replacement simply adds to your handling costs. Make it a rule not to push pallets

with one fork of a truck to line them up for two fork entry. On wood pallets, this damages the corners and shortens their useful life. If such damage is occurring, it might be wise to widen aisles or enlarge storage areas for greater truck maneuverability.

Another rule—again for wood pallets—is never to enter or withdraw from pallet openings with tilted truck forks. This breaks or rips off edges from the deckboards. It'll cost little to place a leveling device on the truck mast which will indicate when the forks are parallel with the floor.

You'll also get much longer life from wood pallets in outdoor use if you apply a chemical preservative on them from time to time. Such treatment will not only retard warping, swelling and splitting of the pallet parts, but it'll discourage termites. As an added bonus, you'll get the pallet fastenings to hold better.

### Expendable pallet uses

Expendable pallets can be useful and economical for one-way handling. But keep in mind that these pallets just don't disappear when they reach their destination. Savings in the apparent first cost could be consumed in gathering and disposing of the pallets.

Treated paper pallets are used successfully in some plants for light loads, straight lifts and where goods are shipped to not-too-distant places.

Whatever type pallet you use, keep looking for improvement in your program. Talk to the fellow on the production line; he may tip you off on better timing of deliveries, condition of received goods, or he might suggest use of stands, dumping tubs or special fixtures for easier handling.

Palletizing and packaging go hand-in-hand. Without proper packaging, the best palletization program in the world won't stop breakage of goods, inefficiency and excessive handling costs. A number of large firms already know this, and so keep a staff at work constantly trying to improve packaging still further. It pays.

Start by making the parts themselves self-supporting. This will add strength to the package. A hardware manufacturer previously packed 12 automobile seat adjusters to a carton. By switching to a new unit load holding 216 seat adjusters and weighing 1000 lb, he now saves 51 pct in material and labor costs.

Package goods in a way consistent with efficient handling practice and adequate protection. In one case, the packaging material was changed from corrugated stock to smooth chipboard, reducing package length by 25 pct.

Watch closely the size of the package, too. You may want to avoid, for example, packages that weigh between 65 and 200 lb. Packages weighing more than 65 lb can't be handled too efficiently manually. Yet the same size package is too small to get the most out of mechanical equipment.

And if you're getting no breakage, don't sit on your laurels. Look into the possibility of over-packaging. It may be that you're spending extra money for protection you don't need.

Westinghouse Photo

Materials which can be bagged, barreled, boxed or baled, or handled as one of these basic shapes, can be palletized and handled by unit load methods.

# Loading and Unloading Devices

◆ AUTOMATIC LOADING and unloading devices have invaded every segment of the metalworking industry, from the ore pit to your customer's receiving dock. No department in your plant, from incoming shipments to final packaging, should be overlooked in considering the cost-cutting possibilities in this equipment area.

Mechanical devices are capable of an amazing range of motions. There are devices which push or pull. Others rotate the part. Still others grasp and lift parts—for machining, for example—or turn them end-for-end, or what will you. For many situations, the question is not what can be done through mechanical handling, but whether the economics of the immediate situation justify the development or installation of the equipment to do it.

Many plant men feel such devices are more closely allied to production equipment than to handling as such. However categorized, they should be included in your considerations if your plant operations lend themselves, in whole or in part, to any degree of automated arrangement. And they should. Even in industries which are not known for their ready acceptance of automatic devices, such equipment is finding wider usage every day.

Several of the most recently built production foundries, for example, have automatic shakeout. In some, gates and risers are knocked off automatically by swinging pendulums of steel.

Other ingenious, self-operating devices lift castings or transfer them automatically from one conveyor to another.

If stamping is a part of your operations, you'll want to find out more about the automatic devices available for feeding blanks into presses; "iron hands" to remove the stampings and feed them to special conveyors which turn the parts or carry them to the next press operation and similar devices.

In machining, the most spectacular gains in mechanical loading and unloading have come, of course, in the big automotive engine and transmission plants. They demonstrate what can be done where the economics of the situation justify the expense. At one engine plant, for example, a block is transferred, moved forward automatically a distance of more than 1200 ft. Broaching, milling, drilling, tapping, boring, gaging operations are all performed.

During the full automatic cycle, the block is turned end-for-end, turned 90°, turned upside down and shifted on its side—all without manual assistance.

Automatic loading and unloading devices will find increasing application in filling the gaps between automatic movement and automatic processing or machining operations, as industry moves more and more towards fuller integration and automation.

ACKNOWLEDGMENT

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**A limited number of copies of "How To Get More For Your Handling Dollar" will be available upon request to Readers' Service Dept., The Iron Age, Chestnut and 56th Streets, Philadelphia 39, Pa.**

# Handling Problems — And Solutions

**Here are a number of examples of how metalworking plants tackled their specific handling problems . . . Brief, factual case histories covering machining, heat treating, steelmaking, casting, etc., may point the way to handling savings in your plant.**

## Grinding:

### Work flow to and from machines is speeded

Smooth flow of production and efficient feeding of castings to tapping machines resulted when a materials handling operation was mechanized with fork trucks.

Now pipe fitting castings fall directly from a foundry conveyor into steel drop-bottom boxes. Then

**Lifting the drop-bottom box at discharge end of conveyor.**

an electric truck picks up the box, carries it to overhead gravity feed hoppers and dumps the castings for rough grinding operations. The truck then takes the emptied box to the other side of the machine to await discharge of the castings.

#### Have Additional Duties

Additional functions of trucks are stacking the boxes between operations for temporary storage in minimum space and carrying filled boxes of rough-finished castings to the scales for a weight check.

This integrated operation replaces a system in which the castings dropped into non-stacking steel shop barrels and were carried away by men with two-wheeled hand trucks. Materials handling by that method resulted in slow and undependable flow of work to the grinding machines where rough spots are ground off the castings.

The trucks are manufactured by Lewis-Shepard Products, Inc., Watertown, Mass.

## Furnace Feed:

### Lift truck places work both in furnace and in quench

Placing castings in a cold furnace and removing hot materials from furnace to a quench tank during heat treating is one of the jobs a group of lift trucks perform effectively in one foundry.

The trucks, of 4000 and 8000 lb capacity, are used 16 to 24 hours per day in transporting raw materials to furnaces, removing cast items to heat treating furnaces, and those taking completed work to storage and to truck or rail shipment. They were built by the Hyster Co., Portland, Ore.

In the furnace operations, an 8000-lb capacity lift truck handles the castings throughout proc-

**Special fork attachments allow placing castings in furnace.**

essing (except for furnace heating phase) and removes pallet of castings to areas where metal working crews do final processing of cast products.

#### Special Attachment Useful

Special fork attachment (see photo) permits placing the hot castings into the quench tank. After placing the work in the tank, the truck can be used for other work while cooling is completed.

Between foundry operations the lift trucks maintain interior and exterior storage areas and service

production machinery during maintenance work.

Haul distance at the plant, the Atlas Foundry Co., Tacoma, Wash., varies from 25 to 1500-ft cycles. The equipment is used to handle heavy loads in confined areas and often around operating machines and workers. Because of the varied surface conditions encountered—concrete floors, slight curb ramps to streets, open and covered drive and aisleway areas—the foundry has found that trucks with pneumatic tires are an advantage.

## Casting:

### One fork truck moves 3 million lb monthly

Speedy, uninterrupted flow of materials from receiving and storage to processing departments is carried out in a metals plant by one 7000-lb capacity fork lift truck.

This unit handles over a million pounds of palletized scrap and ingots delivered each month to the

**Truck keeps bronze moving in continuous casting operation.**

American Smelting and Refining Co.'s Continuous Cast Products Department in Barber, N. J.

The fork lift moves this material 140 ft, at the rate of one 3½-ton load every 60 sec. After this unloading and stacking in the storage department, the material is next transported by the truck to the charge preparation area where the metals are placed in special charge boxes.

The third moving assignment comes when the 560-lb charge boxes are loaded on skids, five at a time, and taken to the melting furnace. All in all, the three-way handling adds up to more than three million lb moved monthly.

#### Provide 50 Pct More Space

The user states that the trucks, due to their high-stacking feature and their extreme maneuverability, have provided at least 50 pct more storage space.

The handling units were built by the Towmotor Corp., Cleveland.

## Core Handling:

### Unique double-tired racks simplify storage

Problems encountered due to a serious shortage of core storage space in a New York foundry were

**Rack supports are angled 45° to aisle for space saving.**

solved when company engineers devised a unique rack handling system.

The system provides an effective method of accommodating a wide variety of cores—necessary because of the variation in volume and class of work from day to day. Now it's possible to keep each type of core separate and readily available for use.

#### Storage Area Doubled

Company engineers, after considering several types of storage racks, selected a type which could be handled with either platform or crane. One, two and three shelf units are provided to accommodate a variety of loads. They are 90 in. long and fitted with hooks for crane handling and with legs to permit entrance of platform trucks beneath them.

Storage space was doubled in the core room by installing stationary supports to permit double-tiering the racks. Floor space is conserved and maximum width travel aisles are provided by having the support built at a 45° angle to the travel aisle.

#### Operation Described

The system operates as follows:

In the core department, the racks are loaded directly from the core ovens with the finished and completely dry sand cores. Racks are then delivered by platform truck to the storage area.

When cores are required in the molding department, the platform trucks pull the proper rack from storage and deliver them there. In the molding department an overhead crane takes the cores to the particular machine where that type of core is being used. Cores for certain foundry jobs are placed in designated storage areas so they can be easily located for delivery to the foundry in sets.

Three electric powered 6000-lb capacity high lift platform trucks, manufactured by Elwell-Parker Electric Co., Cleveland, are used to transport the racks in this installation at the Symington-Gould Corp., Depew, N. Y.

## Chip Disposal:

### Underground troughs-hoppers mechanize removal system

Efficient, effective chip removal at Packard's Utica, N. Y. plant is carried out via an underfloor dis-

**Chips drop from hopper into a bin for transport to salvage.**

posal and coolant system. Outlets for the chips go from machine tools through the floor into troughs.

These troughs lead into receiving reservoirs, the largest of which would just occupy the space of a 6-room house. In the receiving

reservoirs the coolants are recirculated to machine tools, while the chips settle out and are moved from the tanks on drag conveyors.

### Dump Bin For Chips

Under each hopper a Dumpster on an industrial trailer receives the chips. Scheduled runs of Mercury tractors take the loaded trailers to salvage areas where chips are dumped into trucks or in railroad gondola cars. The tractors were produced at the Mercury Mfg. Co.

Main tanks used to process the scrap include: an 18,300 gal grinding sludge settling tank, a 12,000 gal chip settling tank, and a 15,000 gal solube oil concentrate tank.

## Forming:

**Varied foundry duties handled by automatics**

Every seven minutes, 2500 lb of hot iron drain from a cupola into a 1000-lb ladle and cradle loaded

**Every 7 minutes, hot iron drains from cupola into ladle.**

on the platform of an automatic truck. This 3500-lb load is then hauled to a pouring area 100 ft away.

This operation, at the Love Brothers, Inc., Aurora, Ill. foundry, is only one of many capably handled by a series of electric-driven industrial trucks. The trucks are manufactured by the Automatic Transportation Co., Chicago.

The foundry, which produces hundreds of items from 1-lb mold-clamping wedges to 20,000-lb flywheels, has even fitted one truck with a special semitrailer attachment enabling it to haul loads far in excess of rated capacity. These "overloads" are regularly moved from mold room to drying ovens, then back 100 ft to the assembly room.

## Coil Moving:

**Carriers speed handling coils and slabs**

With purchase of three carriers having 50,000 lb capacity, Allegheny Ludlum Steel Corp., Brackenridge, Pa., has been able to bet-

**Load of 3 coils weighing 18,000 lb is ready to be placed.**

ter methods of handling coils and slabs in their mill operations.

Previously, when moving slabs and billets from blooming mills to the conditioning department and back, flat-cars or a tractor-trailer system were used. The coils were transported from the finishing department to the lamination department with a Diesel locomotive, gondola cars and a labor force of four men.

### Flexibility Introduced

The operation was not only time and labor consuming, but in the case of the gondola and flat-cars required an elaborate installation of switches and tracks into each building.

The new method of handling has brought a flexibility of movement previously impossible. For instance, when the slabs and billets are taken out of the blooming mill, they are placed on a steel bolster and the carriers move them directly to the conditioning department. After they have been surfaced, the slabs and billets are again placed on the bolsters and the carrier moves them back to the reheat furnace.

At the end of the hot strip rolling mill the coils are placed on a coil bolster and the carrier moves them three at a time to the finishing department where they are pickled and annealed. Then after finishing, the carrier again moves the coils to the laminating department for stamping.

### Sheet Handled Also

On an entirely separate operation the carrier handles the sheet bar and finished sheets. It moves sheet bar to the mill furnaces where the sheets are rolled. When they are finished, the carrier picks up a bolster load and moves it to the sheet pickling and annealing section. The handler travels over the existing roads throughout the plant without the need for additional equipment facilities.

Allegheny says the carriers, built by the Clark Equipment Co., Battle Creek, Mich., have eliminated manual unloading and stacking of steel. In addition, they have made possible in-plant transport without the use of the track and switch engine system.

## Feeding:

**Drop-bottom box, positioning stand simplify feeding**

Combination of a drop-bottom box and a positioning stand are cutting machine down-time and

**Efficient material positioning with bin box system.**

waste motion as well as reducing operator fatigue at one plant.

Built to supply parts to a work station in a continuing supply at

a convenient work level, the unit eliminates back bending and groping for parts and stops need of lifting parts to work level. Since the work-level tray holds 25 pct of the box contents, empties can be removed and a new supply positioned without work interruption.

### Removable Tray Speeds Job

The positioning stand, like its box partner, is not "married" to a single location. A removable tray end speeds up job finish-off. Then a fork truck drives up, inserts its forks through the bottom crossbars, lifts and shifts to a new location. The same design box is used to feed and receive parts. A third box can be placed back of the machine for scrap collection.

The front angle of the box engages with the horizontal angle of the positioning stand while the hinge ends set on back during set-up. Lowering of the truck forks open hinged bottom and discharge parts into the work-level height tray.

This materials handling system was built by the Union Metal Mfg. Co., Canton, Ohio.

## Crane Uses:

**Versatile 5-ton unit performs varied list of chores**

Duties that can include everything from unloading freight cars, or pushing them on a siding, to

**One of many jobs performed by this 5-ton crane unit.**

moving heavy mill machines and setting them squarely on their foundations, are assigned by a metals plant to its self-propelled crane.

The user, a producer of cold-drawn carbon and alloy bars, obtained this five-ton unit made by Austin-Western Div. of Baldwin-Lima-Hamilton Corp. in 1954. The company, Columbia Steel & Shafting Co., Carnegie, Pa., states that the unit's positive controls and hydraulic precision permit it to handle 6-in. diameter steel bars, 24-ft long and place them where needed without hesitation or surface damage.

### Claw Hooks For Drums

The crane is used on jobs in the yard as well as in the production bays, carrying drums or material or moving machines. When a machine is to be moved, the crane not only picks it up and transport it, but sets it down exactly on the foundation bolts where it was supposed to go. With its magnet attachment, it handles scrap quickly and cleanly.

For transporting drums, production workers made a double pair of claw hooks which are slipped over the ends of two drums, enabling the crane to transport the drums quickly from one point to another. Drums of oil are taken from storage to various plant departments.

Every two weeks, when it is necessary to serve the acid house, the crane, with the help of the hooks, unloads a 50-drum trailer and transports 40 or 50 drums of chemicals.

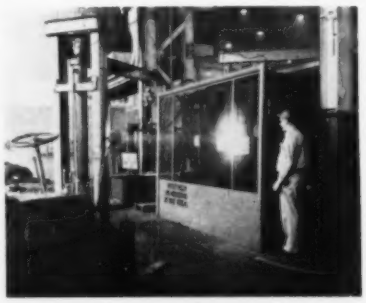
The Austin-Western unit supplements the shipping department's facilities and loads box cars and trucks with finished steel. Other duties include: loading customer trucks, filling in for an overhead crane in unloading 4-ft coils of wire, pulling immobilized trucks, and even moving loaded gondola and box cars on the plant's switch tracks.

## Methods:

**Truck batteries can power lights, phones if needed**

Many important uses are made of storage batteries in the industrial trucks at the plant of the E. W. Bliss Co., Canton, Ohio.

In the event of a power failure, special flood lights are placed in brackets on the trucks and plugged into the truck battery. The lights used are 200 watt, sealed-beam, locomotive headlights adapted for



**Plugged into truck battery, headlight serves in emergency.**

use on 36 volt current. Six lights are available at all times at the truck charging station and two are placed in each of the four production buildings.

Light can be made available anywhere in the plant or grounds that an industrial truck can reach.

### Can Power Phones Also

Industrial truck batteries can also furnish power to the plant telephone system in an emergency by means of a special connection. The regular stand-by batteries will power the telephone system for three hours, then a fork-lift truck is driven to the telephone room, plugged into the system to permit communications for several additional hours.

Occasionally the inter-building diesel locomotive requires more time to start than can be supplied by the regular, diesel starting batteries in the locomotive. A fork-lift truck is parked alongside the locomotive, the truck battery is plugged into the diesel starting system which furnishes the extra ampere-hours needed in cold weather, for example, or when the locomotive does not operate enough to keep its battery charged.

### Transfer Car Used

Because of the great size and weight of the presses, mills and special machinery built by Bliss, a battery-powered transfer car runs on standard gage track connecting all four buildings. This 40-ton Atlas car is powered with a 72-cell

Gould battery which is charged about twice a week for four hours at each charge from a special charger placed near the track.

### Battery Care Listed

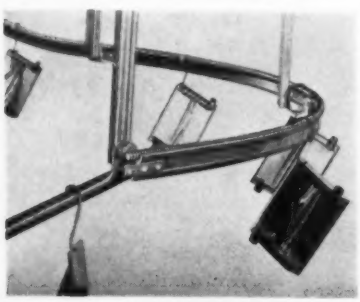
Batteries—supplied by Gould-National Batteries, Inc., Trenton, N. J.—receive excellent care. The twelve rider-type trucks are parked at the charging station by the operators. The motor-generator sets and control panels for battery charging occupy part of the powerhouse. Charging leads are brought through the wall separating the powerhouse and the battery charging station in permanent conduits with two or three leads coming through each conduit. A powerhouse attendant records the specific gravity of each battery, and plugs in the battery for overnight charging.

Eleven rider-type trucks are assigned to jobs on a daily basis, but a hoist mounted on a boom is available for changing batteries when necessary.

## Atomic Energy:

### "Non-moving conveyor" aids atomic scientists

A unique feature of a conveyor which won't itself go out of the handling area has been put to work at



**This unit is typical of the conveyor used in atomic lab.**

the Los Alamos Scientific Laboratory.

There the Chemistry and Metallurgy Research Div. employs inside "dry boxes," which are shielded chambers safely enclosing radioactive materials without contaminating the worker while he is handling the materials.

The feature which makes this Monoflo unit useful in this application is the fact that although the item to be conveyed moves through an area smoothly at a controlled speed, and can be stopped at any point in its travel, the conveyor itself does not move out of the area. The conveyor consists of a flexible steel cable with a spiral outer surface. This cable is retained in a metal casing or rail with an open top just large enough to expose the spiral.

### Propells Load Forward

It is rotated by means of a motor drive coupled to one end and it is this rotation which causes any load hooked over the cable to be propelled forward by the spiral. Thus, unlike the conventional chain or belt conveyor which moves with the load, the cable and its supporting rail remain in place while the load moves ahead.

Therefore in a case where material is to be moved into and out of a contaminated area, the loading portion of the conveyor is always safe since it never moves through the radioactive zone. As the material is conveyed out of the "dry box" it is not necessary to handle either it or the hook by which it is suspended, since by terminating the conveyor over a shielded container, the radioactive load automatically drops off the end of the conveyor into the container.

The flexibility of the cable permits it to follow paths with horizontal and vertical curves and standard rail sections and fittings are available from stock to make up such multicurved systems.

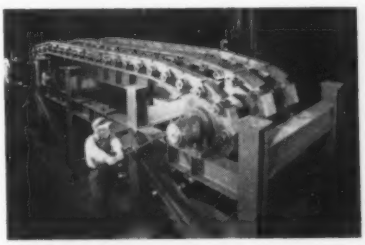
The conveyor is manufactured by the M-H Standard Corp., Jersey City, N. J.

## Conveyors:

### Line for handling steel coils gives long service

A steel conveyor used in transporting and handling heavy materials has proved its durability and strength since the first installation nine years ago at U. S. Steel Corp.'s Irvin Works. At that time a 104-ft conveyor was installed to handle steel coils on the exit end of the 36-in. pickling line. Since that time the line has run on a continuing basis and has never had a breakdown nor even a bearing replaced. Presently over 1061-ft of this make conveyors are in use at this plant.

Other installations include double strand conveyors at the firm's No. 18 hot mill and the 43-in. strip mill at Youngstown District Works (approximately 450 ft), and raw



**Finish check is made on three strand crossover conveyor.**

coil pickling department and finishing mills at Gary Sheet & Tin (approximately 600 ft) and over 2000-ft of conveyors at the modern Fairless Works. Through the years not a single breakdown of these conveyors has been reported during the mills heavy operating schedules.

### Load Automatically

To gain the fullest advantage for the use of a conveyor, additional devices such as upenders and downtilters have been designed to do the loading and unloading job automatically. Also transfer cars are available to handle the steel producers' needs in moving the steel after it leaves the long conveyor lines.

The conveyors, now available for industry-wide use, are built by U. S. Steel's Johnstown Works —a fabricator of tailor-made conveyors and other equipment for transporting and handling heavy coils, tinplate, slabs, sheets and other mill products.

For more case histories turn to page 184

# Material Handlers Move On Cleveland

**Cleveland host to Materials Handling Institute's 1956 Exposition . . . Twenty thousand to attend 12 technical sessions . . . Roam through 160 exhibits.**

◆ MATERIALS Handling people twenty thousand strong will throng Cleveland's Public Auditorium from June 5 through 8 at Material Handling Institute's 1956 Exposition. Twelve materials handling sessions will push "Integrated Handling — Management Profit Tool." Exhibit space already is at a premium, with more than 160 materials handling firms cramming the hall's 106,000 sq ft.

Word has it that new equipment to be unveiled tops that of any prior materials handling show. In the $5½ million total valuation on display, more than 1100 new developments and machines will be included. List of booth displays includes 34 categories, running from adjustable loading ramps to wheels and casters.

In addition to the exhibits, American Material Handling Society will sponsor twelve technical sessions held in conjunction with the exposition. Developed around the theme, the sessions will run Tuesday, Wednesday and Thursday mornings, June 5, 6 and 7. Two concurrent sessions are scheduled daily at 9:00 a.m. and 10:45 a.m.

### Management problems

Top management specialists will discuss management aspects of integrated material handling. Included in the sessions are meetings on work measurement, stock positioning and space control, plant layout, and training.

Technical Sessions chairman, George Smith points out "These sessions are planned to help management use one of its own profit tools—integrated handling."

Speakers include Methods Engineering Council's Grover Barkdoll, Academy of Advanced Management's E. A. Ovens, Harvard University's J. R. Bright, Lever Brothers' R. C. Waehner, Marietta Paper's J. W. Shimp and U. S. Navy's A. J. Briggs.

Barkdoll's talk on "Operation Analysis in Material Handling," will deal with figuring whether mechanical means for handling material can justify themselves costwise.

How management can more closely relate traffic management and material handling will concern E. A. Ovens in his speech. Ovens is Vice President and Dean of the Academy of Advanced Management, and draws on wide experience with manufacturers and railroads.

### Automation survey

Lever Brothers' General Distribution Manager, R. C. Waehner, will get practical about handling costs, and what part material handling, transportation, warehousing, and unproductive labor play in them.

Harvard's James Bright will speak on "Managerial Problems Arising Out of Automation." He will report a 15-month research program carried on in 12 different firms employing highly automated systems of production. The paper will also analyze motives and benefits of automation, liabilities and disadvantages arising from automation, problems of installation and operation, and the impact of the systems on working force and sales effort.

The first national American Material Handling Society dinner will meet at Cleveland Hotel on June 6, at 6:30 p.m. Dinner speaker will be J. R. Bright, Chief Planning Engineer, John Lucas, Ltd., Birmingham, England. He is Past Chairman of the Institute of Material Handling of England. National officers of AMHS will be installed at the dinner and national awards presented.

# AMHS Technical Sessions and Speakers

**All technical sessions of the American Material Handling Society will be held in Cleveland's Public Auditorium from June 5 through 7 . . .**

| | |
|---|---|
| Tuesday, June 5—9:00 a.m.<br>**Relationship of Plant Layout to Material Handling**<br>James Apple, Michigan State University | Wednesday, June 6—10:45 a.m.<br>**Operation Analysis in Material Handling**<br>Grover Barkdoll, Methods Engineering Council |
| Tuesday, June 5—9:00 a.m.<br>**Traffic Management and Material Handling**<br>E. Albert Ovens, Academy of Advanced Traffic | Wednesday, June 6—10:45 a.m.<br>**Distribution in Relationship to Material Handling**<br>Wilbur D. Warner, Sears, Roebuck & Co. |
| Tuesday, June 5—10:45 a.m.<br>**Work Simplification and Its Use in Material Handling**<br>Alan H. Mogenson, Work Simplification Conferences | Thursday, June 7—9:00 a.m.<br>**Paper Mill Management Looks at Material Handling**<br>Joseph W. Shimp, Marinette Paper Co. |
| Tuesday, June 5—10:45 a.m.<br>**Management and Material Handling**<br>George G. Raymond, Jr., President, The Material Handling Institute, Inc. | Thursday, June 7—9:00 a.m.<br>**Managerial Problems Arising Out of Automation**<br>James R. Bright, Harvard University |
| Wednesday, June 6—9:00 a.m.<br>**Analyzing Material Handling Costs**<br>Fred V. Gardner, Fred V. Gardner Associates | Thursday, June 7—10:45 a.m.<br>**Work Measurement and Material Handling**<br>H. B. Maynard, Methods Engineering Council |
| Wednesday, June 6—9:00 a.m.<br>**A Simplified Approach to Stock Positioning and Space Control**<br>Andrew J. Briggs, Head of Material Handling and Warehousing, Navy Bureau of Supply and Accounts. | Thursday, June 7—10:45 a.m.<br>**The Relationship of Industry to Education and Training**<br>Dr. Lillian Gilbreth, Knapp Visiting Professor |

# MATERIAL HANDLING SHOW EXHIBITORS

**MATERIAL HANDLING SHOW**
**Cleveland Public Auditorium**

**SHOW HOURS:**
**June 5 and 6—10 am to 5 pm;**
**June 7—12 noon to 10 pm;**
**June 8—10 am to 5 pm.**

| Exhibitor | Booth |
|---|---|
| **A** | |
| Acme Pallet Co. | 710 |
| Acme Steel Co., Acme Steel Product Div. | 1610 |
| Acme Steel Company, Dexion Div. | 1628 |
| Albion Industries, Inc. | 1339 |
| Algene Marking Equipment Co. | 227 |
| Allen Industrial Products, Inc. | 1337 |
| Allied Mfg. & Sales Co., Div. Grand Specialties Co. | 1402 |
| Allis Chalmers Co., Buda Div. | 1612 |
| Alvey-Ferguson Company | 1132 |
| American Chain & Cable Co., Inc. | A1001 |
| American MonoRail Co. | 1419 |
| American Pulley Co. | 1027 |
| Anchor Coupling Co. | 207 |
| Anchor Steel & Conveyor Co. | A1008 |
| Artco Corp. | A1014 |
| Automatic Transportation Co. | 1234, 1332 |
| **B** | |
| Baker-Raulang Co. | 908, 1432 |
| Ballymore Co. | 501 |
| Barrett-Cravens Co. | A1009 |
| Bassick Co. | 505 |
| Belt Corp. | A1002 |
| Benton Harbor Engineering Works, Inc. | A1017 |
| Berg-Gibson Mfg. Co. | 1030 |
| Better Packages, Inc. | 310 |
| Bond Foundry & Machine Co. | 124 |
| Brainard Steel Div., Sharon Steel Corp. | A1029 |
| Broderick & Bascom Rope Co. | 703 |
| E. W. Buschman Co. | 113 |
| **C** | |
| C & D Batteries, Inc. | 1444 |
| C. I. T. Corp. | 507 |
| Cascade Mfg. Co. | 1326 |
| Chain Belt Co. | 410 |
| Chainveyor Corp. | 322 |
| Chester Hoist Div., Nat'l Screw & Mfg. Co. | A1016 |
| Chicago Tramrail Corp. | 1411 |
| Chilton Co. | 219 |
| Chisholm Moore Hoist Div., Columbus McKinnon Chain Corp. | 302 |
| Clark Equipment Co., Construction Machinery Div. | 1436 |
| Clark Equipment Co., Industrial Truck Div. | 1426 |
| Clark Equipment Co., Ross Carrier Div. | 1416 |
| Cleveland Tramrail Div., Cleveland Crane & Engineering Co. | 216 |
| Coffing Hoist Div., Duff-Norton Co. | 109 |
| Coles Cranes, Inc. | 1630 |
| Colson Equipment & Supply Co. | 128 |
| Colson Corp. | 1021 |
| Construction Equipment Div., Baldwin-Lima-Hamilton Corp. | 1405 |
| Crescent Metal Products, Inc. | 117 |
| **D** | |
| Dempster Brothers, Inc. | 909 |
| Doerr Electric Corp. | 1435 |
| **E** | |
| Thomas A. Edison Inc., Storage Battery Div. | 901 |
| Electric Products Co. | 1427 |
| Electronics and Instrumentation Div., Baldwin-Lima-Hamilton Corp. | 1405 |
| Elwell-Parker Electric Co. | 1020 |
| Equipment Mfg. Co. | A1013 |
| Euclid Crane & Hoist Co. | 208 |
| Exide Industrial Div., Electric Storage Battery Co. | 414 |
| **F** | |
| Fab-Weld Corp. | 1136 |
| Fairbanks Co. | 116 |
| Faultless Caster Corp. | 509 |
| Harry J. Ferguson Co. | A1020 |
| Field Engineering Co. | 105 |
| **G** | |
| Gar Wood Industries, Inc. | 906 |
| General Box Co. | 215 |
| General Electric Co., Apparatus Sales Div. | 1032 |
| General Electric Co., Electronics Div. | 205 |
| Gerlinger Carrier Co. | 1406 |
| Globe Hoist Co. | 1106 |
| Gould-National Batteries, Inc. | 1425 |
| Grand Specialties Co. | 1402 |
| J. W. Greer Co. | 318 |
| **H** | |
| Harnischfeger Corp. | 1502 |
| Hapman Conveyors, Inc., Div. of Hapman-Dutton Co. | A1006 |
| Hercules Motor Corp. | 510 |
| Hertner Electric Co. | 120 |
| Hughes-Keenan Corp. | 121 |
| Hyster Co. | 1116, 1422 |
| **I** | |
| Ingersoll Kalamazoo Div., Borg-Warner Corp. | 1312 |
| Ironbound Box & Lumber Co. | 407 |
| Island Equipment Corp. | 1403 |
| **K** | |
| Kalamazoo Div., New York Air Brake Co. | 1126 |
| Kalamazoo Mfg. Co. | 1034 |
| K. W. Battery Co. (Inc.) | A1015 |
| Kelley Co., Inc. | 512 |
| Knickerbocker Co. | 904 |
| Koehring-Kwik-Mix Co. | 1429 |
| **L** | |
| Lamson-Mobilift Corp. | 1028 |
| Landahl Conveyor Co. (Subsidiary of American MonoRail Co.) | 1419 |
| G. B. Lewis Co. | 422 |
| Lewis-Shepard Products Inc. | 228, 1012 |
| Liftequip Co. | 401 |
| Lift Trucks Incorporated | 702 |
| Louden Machinery Co. | 1015 |
| Loomis Machine Co. | 806 |
| **M** | |
| Magline, Inc. | 101 |
| Magnesium Co. of America | 1218, 1335 |
| Mansaver Industries | 411 |
| Market Forge Co. | A1019 |
| May-Fran Engineering, Inc. | 807 |
| Mechanical Handling Systems, Inc. | 1015 |
| Mercury Mfg. Co. | 1003 |
| Modern Caster Co. | 204 |
| Morse Chain Co. | 1201 |
| Motor Generator Corp. | 1130 |
| Moto-Truc Co. | 416, 417 |
| **N** | |
| Nutting Truck & Caster Co. | 513 |
| **O** | |
| Ohio Galvanizing & Mfg. Co. | 217 |
| Ohio Hoist & Mfg. Co. | 312 |
| Ohio Honing & Hydraulic Co. | A1012 |
| Orangeville Mfg. Co. | A1021 |
| Oster Mfg. Co. | 1608 |
| **P** | |
| Parker Appliance Co. | 1102 |
| Pittsburgh Steel Products Co. | 500 |
| Powell Pressed Steel Co. | 504 |
| Power-Line Sales, Inc. | 714 |
| **R** | |
| Rack Engineering Co. | 808 |
| Radio Corp. of America | 125 |
| Rapids-Standard Co., Inc. | 802 |
| Raymond Corp. | 1122, 1228 |
| Ready-Power Co. | 1409 |
| Republic Steel Corp. | 900 |
| Revolvator Co. | 303 |
| Richards-Wilcox Mfg. Co. | 402 |
| Robbins & Myers, Inc. | 1417 |
| David Round & Son, Inc. | 403 |
| Rowe Methods, Inc. | 301 |
| Ruger Equipment, Inc. | 108 |
| **S** | |
| Sage Equipment Co. | 1240 |
| Saginaw Products Corp. | A1025 |
| Service Recorder Co. | 225 |
| Service Supply Corp. | 1036 |
| Shepard Niles Crane & Hoist Corp. | 102 |
| Silent Hoist & Crane Co. | 326 |
| Spaulding Fibre Co., Inc. | 1328 |
| Stackbin Corp. | 202 |
| Stanley Works | 1011 |
| Stephens-Adamson Mfg. Co. | 316 |
| Sterling Bolt Co. | 701 |
| **T** | |
| G. H. Tennant Co. | 705 |
| Thomas Truck and Caster Co. | 907 |
| Tote Systems, Inc. | 1330 |
| Towmotor Corp. | 1112, 1206, 1301 |
| **U** | |
| Union Metal Mfg. Co. | 608 |
| Union Steel Products Co. | 1317 |
| Unistrut Products Co | 304 |
| **V** | |
| Vickers, Inc. | 1415 |
| **W** | |
| Waukesha Motor Co. | 801 |
| Jervis B. Webb Co. | 110 |
| Weber Marking Systems, Div. Weber Addressing Machine Co., Inc. | 708 |
| West Bend Equipment Corp. | 210 |
| Whiting Corp. | 1029 |
| **Y** | |
| Yale & Towne Mfg. Co. | 1004, 1212 |

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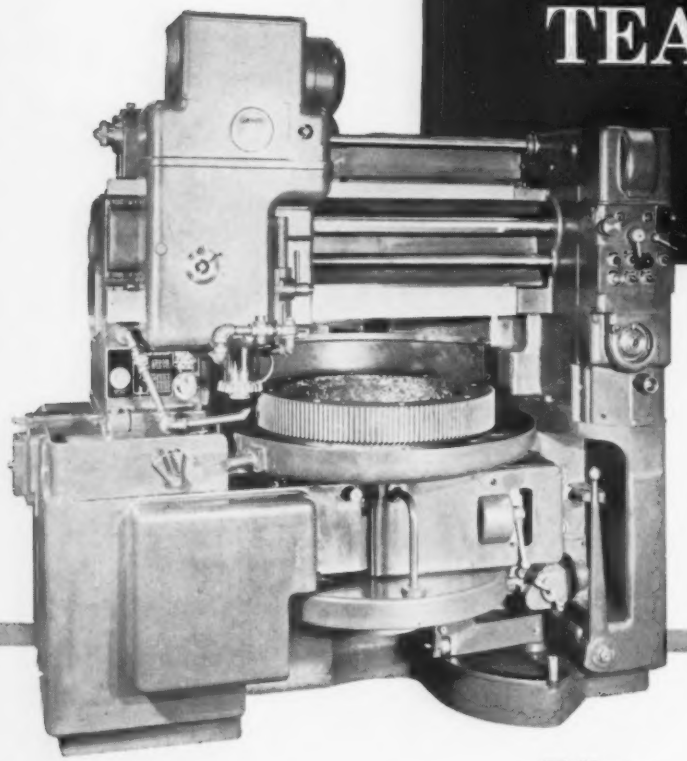
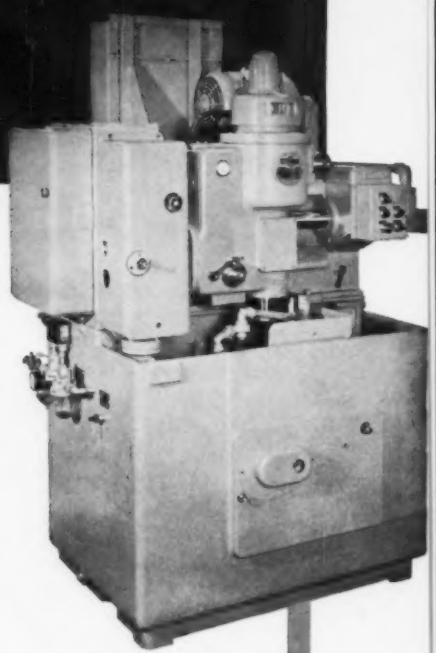


*Fellows 36-Type Gear Shaper:*

**produces gears up to 36" p.d., 6" face width.**



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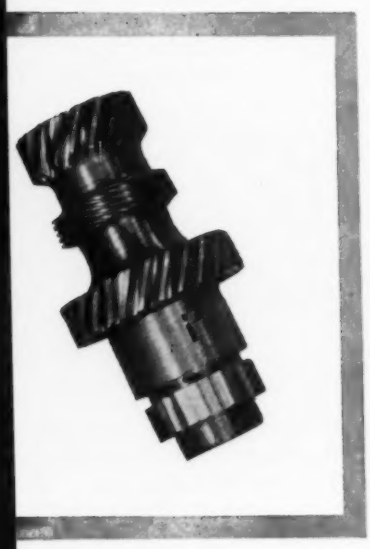

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The new Fellows No. 4GS Gear Shaper finish-cuts internal and external spur and helical gears up to 6″ p.d. and 2″ face width, at 9 cutter speeds from 98 to 635 strokes per minute! It can be used for general purpose gear cutting or adapted to semi-automatic or completely automatic operation for large production runs. Rigid mechanism assures high speed with close tolerances. Rotary feeds from 0.008″ to 0.028″ based on 4″ p.d. cutter

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# A tooling problem?

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# New Technical Literature:

## Catalogs and Bulletins

### Investment casting

Design data developed over a period of more than 10 years' experience in producing investment castings are outlined in a new 40-page booklet. Typical physical, mechanical, and chemical properties of 26 investment-casting alloys are also included. The 26 alloys described were selected from over 300 tested under actual production conditions as being most suitable for use with this firm's investment-casting method. Helpful hints as to when to consider the investment-casting process to solve design, production, and metallurgical problems are also included. *Haynes Stellite Co.*

For free copy circle No. 19 on postcard, p. 181

### Tracer milling unit

Bulletin describes a new 3-dimension tracer milling unit that was designed for taking numerous cuts on large work pieces by moving the cutter instead of the work piece. The unit is self contained and can easily be moved to many different positions for intricate cuts in transverse, longitudinal or vertical directions. As the cutter moves rather than the work piece itself, greater accuracy can be maintained, and less floor space is required, the bulletin states. *Sundstrand Machine Tool Co.*

For free copy circle No. 20 on postcard, p. 181

### Centrifugal pumps

Double suction, single-stage centrifugal pumps are described and illustrated in a new 8-page bulletin. They are recommended for general service wherever liquids of low viscosity are to be moved. Case is split on horizontal center line and rotating parts can be removed for maintenance without disturbing piping. Cross-section drawings and construction details for standard sizes up to 10-in. discharge are included. *C. H. Wheeler Mfg Co.*

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### FOR YOUR COPY

***Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 181.***

### Welded chain

Welded chain, welded chain assemblies and accessories are covered in a new catalog. The 62-page, 2-color publication describes and illustrates over 25 different types of welded chain and chain assemblies, plus a complete line of accessories. Types of welded chain listed include proof coil, BBB, Republic alloy, high test, and a variety of other standard and special chain types. The first seven pages of the book form a general information section on welded chain, with important points on its care and maintenance. Detailed suggestions for correctly measuring and ordering chain are also included in this section. Various tables are included in the back of the catalog. *Republic Steel Corp.*

For free copy circle No. 22 on postcard, p. 181

### Masking tape

A new brochure describing all-purpose masking tapes is available. Of the three main lines of tape described in the brochure, two offer flexibility, an important factor in many masking operations. These are a crepe-backed tape, designed primarily for use where maximum stretch is required and a new flexible flatback tape for use where moderate stretch is required. The third is a strong flatback tape where extra strength is needed. The brochure stresses the primary considerations in designing a tape for efficient masking. *Permacel Tape Corp.*

For free copy circle No. 23 on postcard, p. 181

### Electrical equipment

"System Engineered Equipment for Industrial Plants," is a 48-page bulletin giving information on distribution system planning, features, advantages, application, operation and other data on system-engineered equipment for industrial power distribution. Sections are included on such equipment as switchgear, switchboards, unit substations, transformers, panelboards and controls. *General Electric Co.*

**For free copy circle No. 24 on postcard, p. 181**

### Polystyrene for design

"Imagineering for Profit with Dylite Expandable Polystyrene," is described as "an idea book of practical products which can be made from this new material." Dylite is mentioned as a completely different foam plastic which offers the designer toughness, lightness of weight, smooth skin, buoyancy and excellent insulating value. Among the sections in the booklet are those on Dylite's use in insulation and construction, in packaging and in the building of displays. *Chemical Div., Koppers Co., Inc.*

**For free copy circle No. 25 on postcard, p. 181**

### Melting furnaces

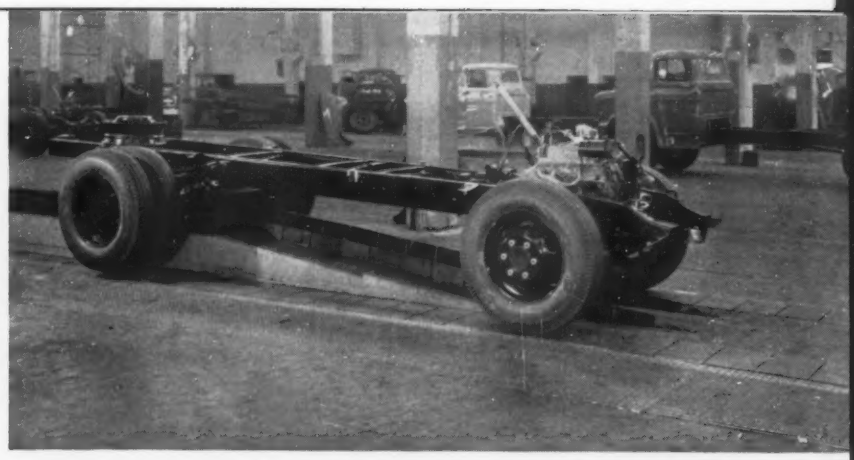
A line of direct-arc melting furnaces, described as especially suited for the production of high quality carbon and alloy steels, are delineated in a 14-page brochure. Features of the furnace design, and installations of units ranging from 1 to 40 ton are detailed and shown. The feature of arc regulation and its advantages are also covered. *Incandescent Heat Co., Ltd.*

**For free copy circle No. 26 on postcard, p. 181**

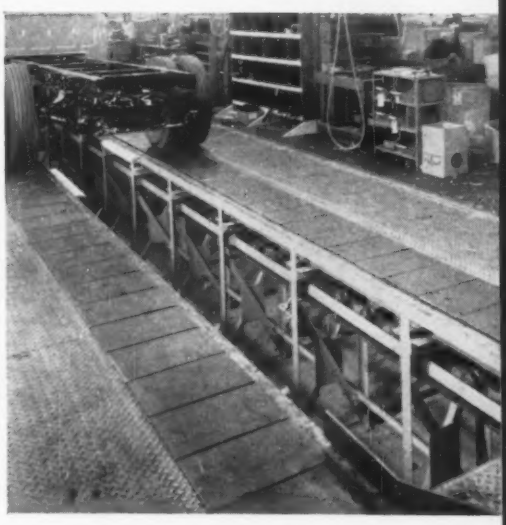
### Company profile

Forty-eight page booklet discusses a firm's products and the manufacturing divisions which make them. Sections covered include a Fabricon Products Div. for the making of plastics, fiberglass-resin molded parts and decorative laminates; an Insulation Div.; a Mining and Smelting Div.; a Rubber Co. Div.; and a Chemical Div. Photographs are used throughout the book to explain various company sectors. *Eagle-Picher Co.*

**For free copy circle No. 27 on postcard, p. 181**

NEW **Heavy Duty** CONVEYOR
SYSTEM HANDLES 16 TON TRUCKS



**Engineered and Installed by PLANET**

32,000 pound gross weight vehicles are moved with ease on the assembly line conveyor recently designed and installed by Planet in a large new truck and bus plant. The complete Planet system includes sub-assembly lines which feed the main assembly line. This is in two units with a knife-edge type conveyor feeding onto a flat top assembly type conveyor (illustrated above.)

If you have a production problem involving the movement of parts or materials, Planet know-how and experience can help you. Write or phone today — there is no obligation.

IT PAYS TO PLAN WITH PLANET

**PLANET CORPORATION**
1825 SUNSET AVENUE
LANSING, MICHIGAN

- CONVEYORS
- ENGINEERED SYSTEMS
- FOUNDRY EQUIPMENT
- AUTOMATION
- STEEL FABRICATION

# PACING INDUSTRY WITH RESEARCH

Chief Sandusky

**FERROUS AND NON-FERROUS CENTRIFUGALLY CAST SLEEVES, ROLLS, LINERS, TUBES, RETORTS, CHUTES, RINGS, BUSHINGS, BEARINGS, ETC.**

Our continuing development program is a major factor in meeting your ever increasing demands for ferrous and non-ferrous centrifugal castings. And research is a vital phase in keeping ahead of your requirements.

Precise metallurgical control is maintained throughout the entire manufacturing process to produce strong, uniform, close-grained castings which are extremely resistant to heat, corrosion, and abrasion. Excellent machining facilities for turning, boring, and drilling are also available.

***You can rely on Chief Sandusky as a versatile integrated centrifugal specialist where castings are produced to your specific requirements with modern, up-to-date equipment.***

**C. M. Lovsted & Co., Seattle, Wash. ● Tynes Bros., Birmingham, Ala. ● Cordes Bros., San Francisco and Wilmington, Calif.**

**Chief SANDUSKY CENTRIFUGAL CASTINGS**

FERROUS AND NON-FERROUS

**SANDUSKY FOUNDRY AND MACHINE CO., Sandusky, Ohio**


FREE TECHNICAL LITERATURE

## Gear transmissions

A new 8-page booklet just issued discusses seven different models of a company's new Plan-Gear Transmission. These new transmissions, of the planetary gear type, are offered with one or two forward speeds, a choice of reverse gear ratios and 85 to 150 lb ft to 200 lb ft torque. They include many advantages for applications on road building equipment, lift-trucks and similar equipment. The booklet describes the operation of the transmission, lists its advantages, suggests possible uses and gives design data. *American Gear & Mfg. Co.*

**For free copy circle No. 28 on postcard, p. 181**

## Architectural products

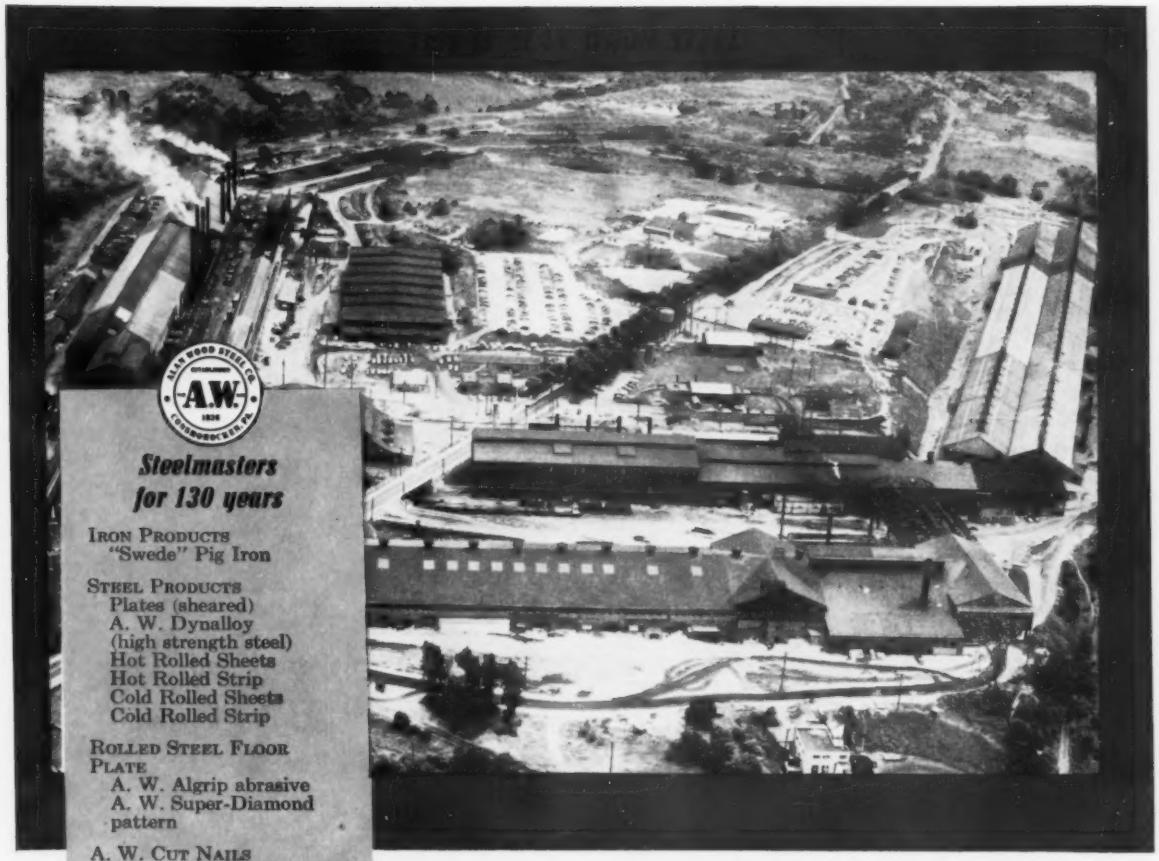
An entire line of architectural products are discussed in a new catalog. Included is a continuing line of 6-, 8- and 9-in. joists, 1 11/16 to 3⅝ in. studs, 2⅛ to 3 13/16 in. punched channels, 11/16 to 6¼ in. unpunched channels, cold-formed columns and beams, and galvanized ribbed decking. New products listed in the publication include metal curtain wall panels and 10- and 12-in. joists. *Stran-Steel Corp.*

**For free copy circle No. 29 on postcard, p. 181**

## V-belts

Bulletin contains numerous illustrations of many types of V-belts available for drives employed in heavy industrial applications and miscellaneous light machinery drives. Featured are steel cable belts which have the highest horsepower rating of any standard section V-belt. They are especially adaptable for drives requiring extra strength and heavy continuous service. Also described are the Hy-T belts, a synthetic fiber with the surplus stretch removed; the EC cord V-belt designed for conventional drives; the open-end V-belts for line-shaft drives, no-take-up drives and dismantle-to-install drives which will work on any V-belt drives with normal hp ratings; and the Vee Ply belts (quick detachable V-belt) adaptable to most V-drive applications where continuous heavy-duty service is needed. *Worthington Corp.*

**For free copy circle No. 30 on postcard, p. 181**



***Steelmasters for 130 years***

IRON PRODUCTS
"Swede" Pig Iron

STEEL PRODUCTS
Plates (sheared)
A. W. Dynalloy (high strength steel)
Hot Rolled Sheets
Hot Rolled Strip
Cold Rolled Sheets
Cold Rolled Strip

ROLLED STEEL FLOOR PLATE
A. W. Algrip abrasive
A. W. Super-Diamond pattern

A. W. CUT NAILS
Standard & Hardened

MINE PRODUCTS
Iron Ore Concentrates
Iron Powder
Crushed Stone
Grit
Sand & Engine Sand

COKE
Foundry, Industrial & Metallurgical

COAL CHEMICALS
Ammonium Sulphate
Benzol
Toluol
Xylol
Naphthalene
Sodium Phenolate
Tar Bases (Pyridene)
Solvent Naphtha
Crude Still Residue

PENCO METAL PRODUCTS DIVISION
Steel Cabinets, Lockers & Shelving

## "Lots of trouble to get good product"

Said by the founder of Alan Wood Steel—James Wood—over a hundred years ago, that statement set a manufacturing standard for five generations of steelmaking Woods. Today, as then, the ". . . trouble to get good product" includes modern equipment, facilities, research, development and determination. Accepting that "trouble" has led to a nearly $50,000,000 expansion expenditure in ten years that has helped us supplement our greatest selling advantages—"good products" and individualized attention to orders by a compact, fully integrated, flexible steel mill.

For detailed information on any Alan Wood product, write Marketing Division—Department AW-47.

# ALAN WOOD STEEL COMPANY

*CONSHOHOCKEN, PA.*

*PHILADELPHIA, PA.*
*IVY ROCK, PA.*
*SWEDELAND, PA.*
*DOVER, N.J.*
*OXFORD, N.J.*

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Montreal and Toronto, Canada: A. C. Leslie & Co., Limited.



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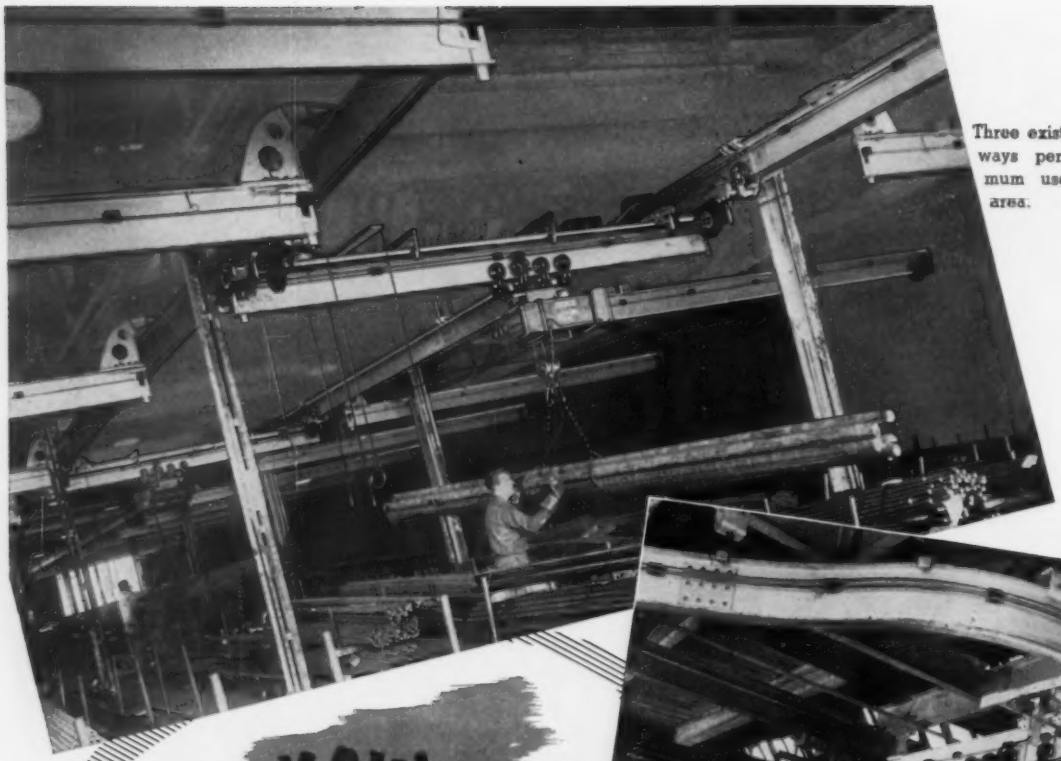
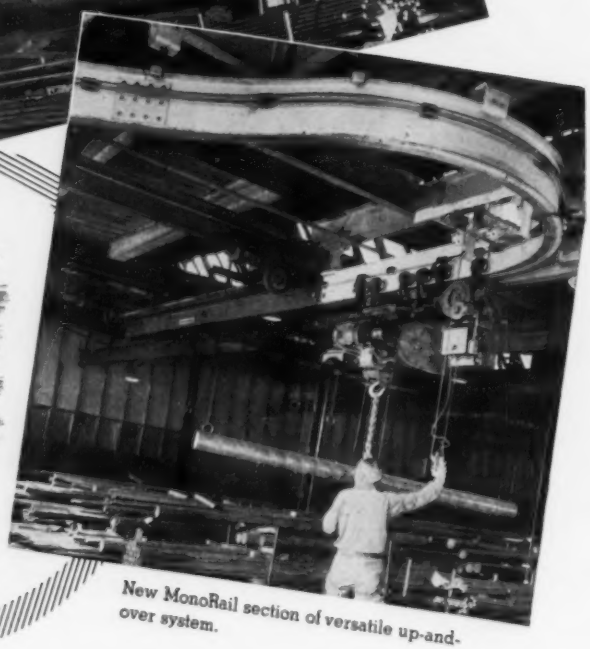


Three existing craneways permit maximum use of floor area.

# new MONORAIL ties into old... for flexible system



New MonoRail section of versatile up-and-over system.

A newly engineered section was added to three existing MonoRail craneways in this bar stock warehouse. As a result, incoming material can be picked up from a car and transported on this highly efficient overhead system to storage area. When the raw stock is needed, this up-and-over system has it there on schedule. If you have a materials handling problem, call your nearby American MonoRail engineer. He is qualified to help you answer it.

**Member of Materials Handling Institute - MonoRail Association**

*Photos courtesy of Super Steels, Inc., Chicago, Ill.*

AMERICAN OVERHEAD HANDLING EQUIPMENT MONORAIL COMPANY

13103 ATHENS AVENUE
CLEVELAND 7, OHIO

# FREE TECHNICAL LITERATURE

**These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.**

This section starts on p. 176

## Hydraulic lift tables

Information is available on new hydraulic tables for use in lifting heavy castings, dies, machine accessories, etc. May be used as adjustable work bench, welder's positioning table, leveling table for presses, conveyors and loading trucks. Table capacity 2000 lb. Hydraulic unit is 3000 lb. Literature gives data on color, safety items, mountings, construction and model list. *Lexco Engineering & Mfg. Corp.*

For free copy circle No. 31 on postcard

## Pipe and tubing

New 12-page catalog illustrates and delineates a line of corrosion-resistant polyethylene and polyvinyl chloride pipe, tubing, ducting, valves and fittings for industrial applications. Information contained for the first time in this revised edition includes a summary of the firm's pipe materials in comprehensive form; a fuller explanation of fabricated pipe fittings; details on larger dimensions of cast pipe; properties of their pipe materials; and a complete listing of available literature offered by the company. *American Agile Corp.*

For free copy circle No. 32 on postcard

## Sheet metal fabricator

A broad range of applications for a sheetmetal fabricator, which offers versatility and rapid interchangeability of punches and dies, are described in a new bulletin. The fabricator uses adjustable gages to insure accurate positioning of work for duplicating hole locations, and an interchangeable holder which automatically aligns punches and dies. *Wales-Strippit Corp.*

For free copy circle No. 33 on postcard

## Reciprocating furnace

Bulletin describes a controlled atmosphere reciprocating furnace which features a movable hearth within a stationary muffle for conveying work through the processing cycle. Operating advantages of the furnace for continuous production heat-treating, light case carburizing, clean hardening and ni-carbing are detailed. *American Gas Furnace Co.*

For free copy circle No. 34 on postcard

## Gas rectification

Single and double rectification plants for the production of oxygen or nitrogen in gaseous or liquid form are described in a new catalog. Liquid air plants and acetylene plants are also illustrated and described. Production data and flow diagrams are included for each type of plant, which range in capacity from 250 to 10,000 cu ft per hr and produce oxygen of 99.5 pct purity. *Superior Air Products Co.*

For free copy circle No. 35 on postcard

## Metalworking machines

How metalworking machines perform a wide variety of forming, cutting, punching and notching operations in medium and light weight materials is detailed in a 44-page catalog. A feature of the publication is the arrangement of machine specifications and material forming capacities in tabular form for ready reference. Additional pages list complete specifications and cost information on standard press brake dies as well as showing press brake engineering tables. Standard punch press punch and die listings are also given. *O'Neil-Irwin Mfg. Co.*

For free copy circle No. 36 on postcard



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FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

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**THE IRON AGE**
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

## Thermocouple restorer

Catalog R-26 describes the thermocouple circuit "restorer" device for renewing proper electrical conductivity through thermocouples and thermocouple circuits used in heat-treating, melting and other processing operations. Diagrams, installation photos and recorder chart reproductions illustrates how the restorer monitors couples and thermocouple circuits transmitting emf to temperature indicators, recorders and controllers. *Peerless Electric Co.*

**For free copy circle No. 37 on postcard**

## Contact connectors

A new 4-page brochure, "What's New at Alden's," shows a series of compact single and multi-contact contact connectors. They are described featuring perfect strain relief, a natural sealing against dust and moisture trapping, shorter leakage paths and greater reliability. This connection technique is described in detail and illustrations and application of the company's connectors and unit cables are shown. *Alden Products Co.*

**For free copy circle No. 38 on postcard**

## Right-angle gearmotor

A new booklet presents the type R right-angle gearmotor for applications requiring 1 to 30 hp. By means of photographs and diagrams, the booklet describes the construction and operation of the gearmotor, including the double-enveloping gears used in this new unit. A chart is also provided showing the relationship between output torque capacity and total gear ratio. *Westinghouse Electric Corp.*

**For free copy circle No. 39 on postcard**

## Mist generator

Cooling with mist in the metalworking industries is investigated in a 4-page brochure. The operating principle of the mist generator, its ease of installation, advantages of this method of cooling, as well as the results to be expected on various jobs are all described. The principle that heat is absorbed as compressed air expands, is mentioned as the reason why mist cooling is so effective. *Aetna Mfg. Co.*

**For free copy circle No. 40 on postcard**

## Metal finishing

A new 12-page reference booklet on "Metal Finishing Standards" covers the subject of plating and surface treatment of products very thoroughly. First section of the booklet is devoted to general facts on metal finishing. Second section, arranged in table form, covers various types of plating, with a clear statement of advantages and limitations, applications, specifications, and appearance of each type. Third section is a similar table for various types of surface treatment. *Allen Mfg. Co.*

**For free copy circle No. 41 on postcard**

## Pressure test units

Standard and special purpose pressure test machines for automotive, appliance, aircraft and farm equipment industries are described in 4-page Bulletin PT-1. A number of the machines discussed are designed for inclusion in automation lines. Some accept work from the preceding operation, check several air or water passages, color code parts found defective to indicate area of leaks for easier rework and either pass along satisfactory parts to continuing operations or shunt aside rejects, all without any operator attention. Also described in Bulletin PT-1 are units for checking parts and submerging those found defective for precise location of leaks. *Modern Industrial Eng. Co.*

**For free copy circle No. 42 on postcard**

## Industrial fans

Line of industrial fans designed to handle corrosive and explosive fumes, high temperatures and humidity, abrasive dusts and dirt-laden air is featured in a new bulletin. The 6-page, 2-color bulletin describes the application for the belt-driven tube-axial fans and the requirements for use under special conditions such as high temperatures, corrosive exhaust and outdoor installation. Photographs, cross-section drawings and charts illustrate features of the fans, which are available in two types—for applications at normal or high temperatures. *Propellair Div., Robbins & Myers, Inc.*

**For free copy circle No. 43 on postcard**



**BUSINESS REPLY CARD**

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**THE IRON AGE**

Post Office Box 77
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NEW YORK 14, N. Y.

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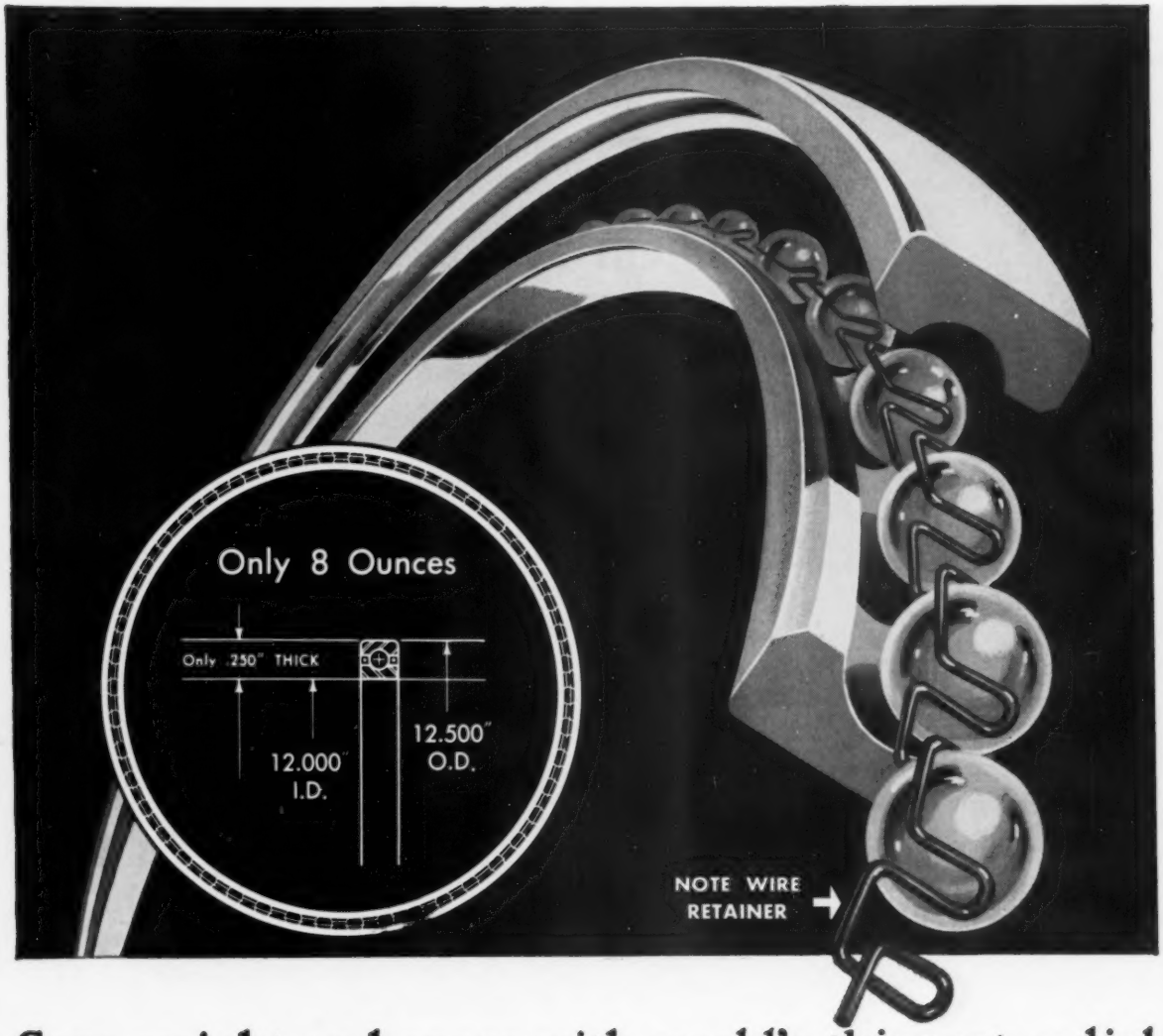



# Save weight and space with world's thinnest radial ball bearings—*Reali-Slim* by Kaydon

HERE it is! A *Reali-Slim* radial ball bearing with a wire separator that has just short of a full complement of balls for maximum capacity. What's more, you still get all the advantages of a separator between the balls. This design also gives you a bearing that's light-in-weight and is, without a question, the thinnest bearing ever built in this diameter.

Whatever your product design, there's a small or large diameter *Reali-Slim* bearing that can be the right answer to your thin-section bearing problems.

The radial ball bearing, illustrated here, is *really slim* — 12.000" I.D., 12.500" O.D., .250" thick . . . *and weighs only eight ounces.* It has 9,810 lbs. static load capacity, 1,256 lbs. at 100 rpm. Kaydon is able to produce *Reali-Slim,* high-precision bearings because Kaydon specializes in the unusual.

Kaydon bearing engineers are prepared to give you valuable help with technical, thin-section bearing problems.

For detailed information on Kaydon's *Reali-Slim* line, ask for engineering catalog No. 54-RS3 detailing:

*Reali-Slim Ball Bearings* — Conrad, angular contact and 4-point contact types in seven standard cross sections from ¼" to 1.000" and in bore diameters from 4" to 40".

*Reali-Slim Roller Bearings* — Radial and taper roller types in cross sections from 9/16" and in bore diameters from 5" to 40".

THE KAYDON ENGINEERING CORP.

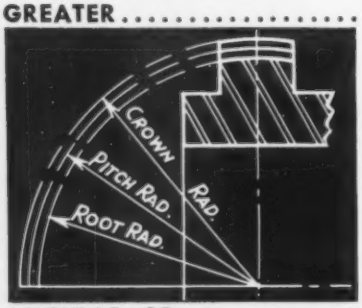
MUSKEGON • MICHIGAN

K-561

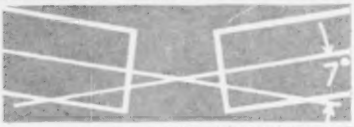
*All types of ball and roller bearings — 4" bore to 120" outside diameter . . .*

*Taper Roller • Roller Thrust • Roller Radial • Bi-Angular Roller • Spherical Roller • Ball Radial • Ball Thrust Bearings*

PERFECT SPHERICAL TOOTH FORMATION PERMITS GREATER.....




ANGULAR OR.....

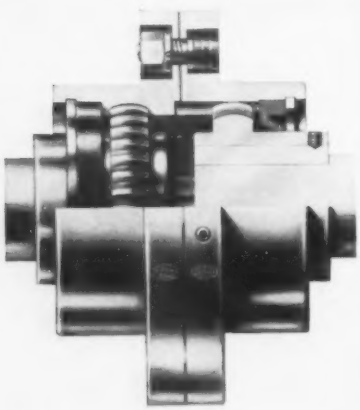



.....LINEAR MISALIGNMENT

The Philadelphia SPHEREFLEX COUPLING features a Spherical cut tooth which allows a ball and socket action between mating teeth up to 14° angular misalignment—and due to this angular capacity, a much greater amount of parallel misalignment is possible, which varies directly as the pitch diameter of the gears. All this is accomplished by gearing having a minimum back-lash.

By using Sphereflex Couplings, you can eliminate excessive bearing loads and cyclical bending stresses, which are caused by misalignment between shafts.

Send for Catalog C-560, and be convinced.



phillie gear

PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.

Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS
LIMITORQUE VALVE CONTROLS
FLUID AGITATORS • FLEXIBLE COUPLINGS

Virginia Gear & Machine Corp. • Lynchburg, Va.

# Handling Case Histories:

**A look at the methods and the equipment employed at 10 installations to solve materials handling problems . . . They cover everything from packing to maintenance.**

## In-Plant System:

**Carriers ease handling, move bars still hot.**

Until recently, all in-process and finished steel was stored and shuttled around in an eastern steel mill by railroad gondola.

The system required trackage, locomotives, switching crews plus special loading and unloading equipment at each building. In addition, it had the basic disadvantage of no flexibility.

The company decided to solve the problem by purchasing 5 self-powered carriers built by the Clark Equipment Co., Battle Creek, Mich. Their advantages are easily apparent: They can move steel where it is needed at a minute's notice. They require no special right-of-ways. With their use every spare piece of ground, such as between buildings, next to roadways and even outside of doorways, can be made available for storage.

### Heat Deflector Added

A handy adaption of the trucks by the user, the Midland, Pa., Works of the Crucible Steel Co. of America, permits the carriers to pick-up and move a bolster-load of bars to storage while still hot. On two of the trucks servicing the end of the finishing mills a heat deflecting plate was fabricated.

This ⅜ in. thick plate was welded underneath the arch of the carrier about 4 in. down from the top. With it operators can move steel at temperatures around 900°F, although some of the bars handled are around 1600°F. After a couple of experiments, it was found that the unrestricted movement of air under the arch did far more in protecting the carrier than extensive shielding.

**Carrier moves hot bars from finishing mill to storage.**

### Do Work of 3880 Gondolas

This "hot stage" carrying eliminates congestion when the mill is really rolling, as the bars can cool in storage rather than tying up the manufacturing facilities.

In terms of general benefits, the five carriers averaged a carry load of 475 each on 8 hr shifts during a recent month. The average load was approximately 15 ton and a round trip took about 15 minutes. Under the old method this same tonnage would have required 3880 gondolas.

### Integration Results

The carriers have integrated the transportation system at Crucible and their assignments include almost all of the in-process handling and storage of steel. One charges the furnaces in the finishing mills, two move in-process steel between conditioning and finishing mill and two move steel from finishing mills to storage.

### WANT MORE DATA?

***You may secure additional information on any item briefed in this section by using the reply card on page 181. Just indicate the page on which it appears. Be sure to note exactly the information wanted.***

# Controls:

## Operatorless tractor guided electronically

An electronic industrial tractor that requires no operator is successfully being used in warehousing operations.

It operates in this manner: Embedded just beneath the surface of the warehouse concrete floor is a guide wire which emits an electronic signal. This is sensed by the guidance receiver on the tractor guiding the unit left or right and controlling starting and stopping. (The guide system may also be a wire under a tape laid on the floor or a wire strung overhead.)

There is no physical contact between wire and tractor. Signals

**All movements of this unit are signal-actuated.**

are picked up by a receiver mounted on the tractor.

Working in an undeviating path, the Guide-O-Matic can pull up to 6000 lb of freight, the maker states. It is also described as eliminating the danger of running off course and striking merchandise.

The electronic wire stretches along some 300 ft from truck loading docks to storage sections.

Tractor has a top speed of more than six miles per hour, although it generally is operated at half that speed in the warehouse. It is equipped with hand controls for conventional battery - powered tractor use when desired.

The Guide-O-Matic is manufactured by Barrett-Cravens Co., Northbrook, Ill.

there's only one MALLEABRASIVE!

Since 1939, when the introduction of Malleabrasive revolutionized blast-cleaning, there has been only one MALLEABRASIVE!

MALLEABRASIVE was developed through exhaustive research. Its leadership has been maintained through continuing research and improvement.

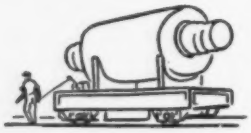
- Today there is still only one genuine MALLEABRASIVE.
- MALLEABRASIVE has no exact counterpart—there is no other product exactly like it.
- MALLEABRASIVE is patented because of its own distinctive metallurgical characteristics.
- MALLEABRASIVE is produced only by manufacture under the full and complete MALLEABRASIVE process—used by Globe exclusively.

The qualities that make Malleabrasive distinctively different have made it the most widely used premium abrasive in the world today. In hundreds of plants it has made important reductions in blast-cleaning costs. Undoubtedly it can do the same in yours. At least, why not investigate its possibilities? Write us.

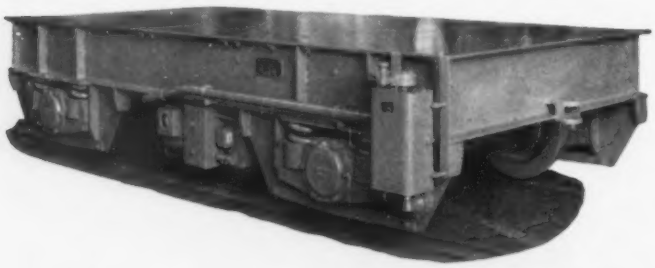
**THE GLOBE STEEL ABRASIVE COMPANY**
**MANSFIELD, OHIO**
*Subsidiary of Pittsburgh Crushed Steel Co., Pittsburgh, Pa.*
*Also sold and recommended by Pangborn Corp., Hagerstown, Md.*

MALLEABRASIVE®

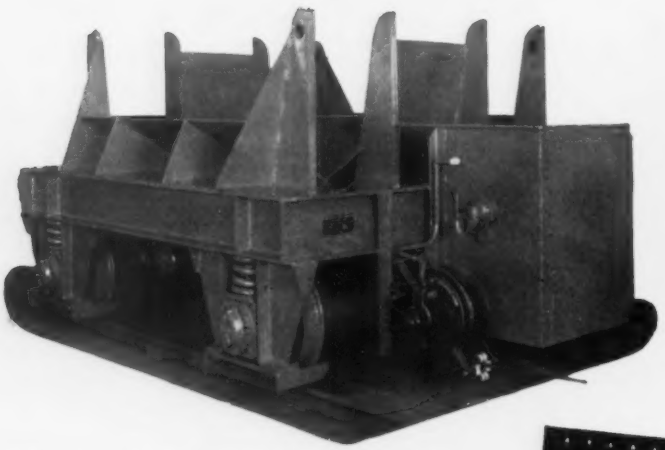
# TRANSFER IT SAFELY
## *at Less Cost with*
# ATLAS



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



**50-TON STORAGE BATTERY FLAT CAR**



**64-TON ELECTRIC FLAT CAR**

*Request "Walk-Along" Bulletin 1283*

THE ATLAS CAR & MFG. CO.
ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.




## Shipping:

### New reel-less coil package for wire introduced

Significant reductions in shipping costs for steel wire are described possible with a new reel-less coil package.

Especially designed for handling bead wire used in the manufacture of automotive tires, the new coil package replaces shipping the wire on heavy reels.

The development offers wire to manufacturers in tightly-bound coils, spiral wrapped in heavy paper and palletized for easy handling. The packaged wire is supplied in two coil sizes: two 1000-lb coils or four 650-lb coils, interlocked with steel strapping on a wooden pallet.

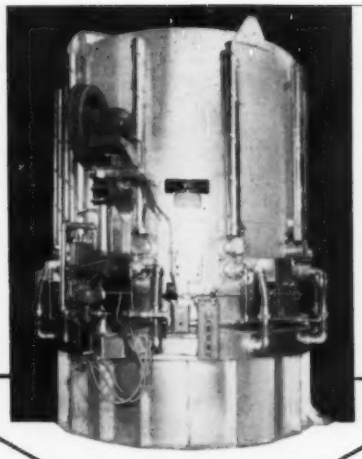
**Eliminates Returns**

In addition to reducing tare weight substantially, the reelless coil eliminates empty reel returns, conserves storage space and facilitates rotation of inventory, as well as reducing unloading and in-plant handling.

**After coil is lifted, rip wire removes wrapping.**

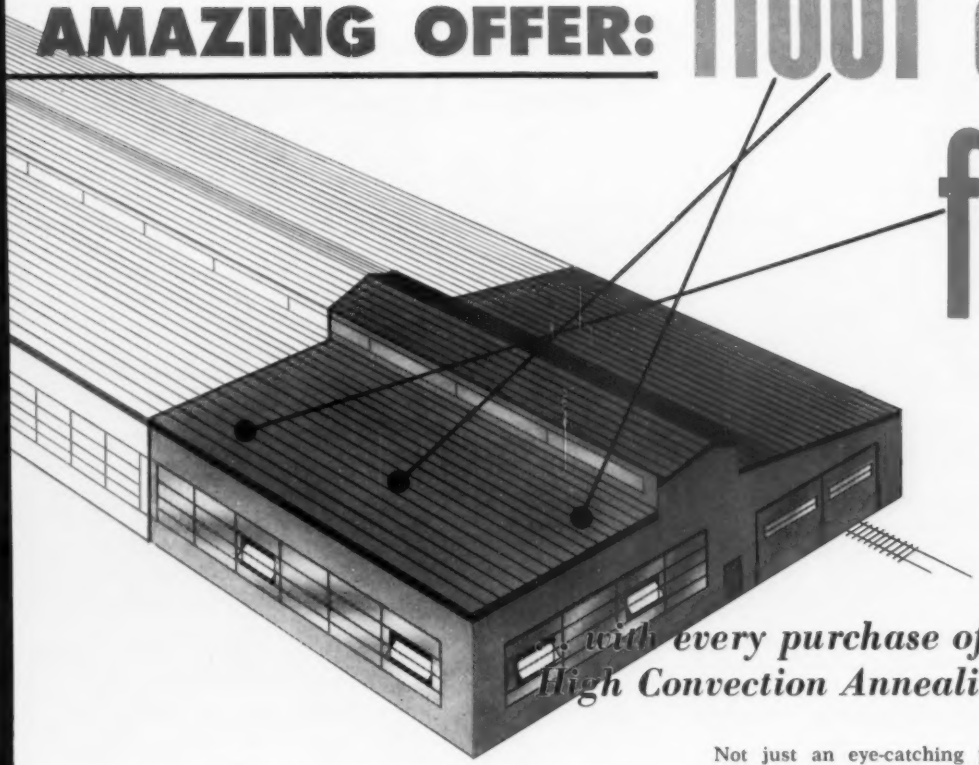
Specially-engineered equipment simplifies handling the coils in the user's plant. It consists of a point-of-use pneumatic let-off reel with detachable flange, a saddle block for assembling the reel and an ingenious pneumatic coil lifter to transfer the coil from horizontal to vertical position.

The cast aluminum let-off reel



# Industrial floor area free!

## AMAZING OFFER:



*with every purchase of Lee Wilson High Convection Annealing Furnaces*

Not just an eye-catching phrase, this has been proved in many of the nation's foremost steel plants. The Lee Wilson single stack system produces more annealed tonnage per square foot of floor space than any other annealing method in use today.

This means that if you're annealing any sizable tonnage at all, the resultant saving in floor space actually would equal that of a fair size building. That's why we say every purchase of Lee Wilson High Convection Annealing Furnaces gives you extra floor area free!

Let us prove this fact to you. A Lee Wilson sales engineer will be happy to meet with you at your convenience and explain how this equipment saves floor space. He'll give you good reasons, too, why the Lee Wilson Single Stack is the nation's best annealing furnace.

**Lee Wilson ENGINEERING COMPANY, INC.**

20005 WEST LAKE ROAD • CLEVELAND 16, OHIO

SINGLE-STACK RADIANT TUBE ANNEALING FURNACES

MAKE THE BEST METALS BETTER

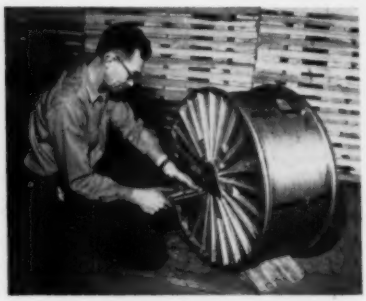
9931

* ORIGINATORS AND LEADING PRODUCERS OF SINGLE-STACK RADIANT TUBE FURNACES

has six radial slots in each flange and a spider which is inserted into the paper composition core of the wire core. A 3-in. nut holds the demountable flange securely in place.

**Let-Off Bettered**

The let-off reel is designed with a donut-shaped rubber air bag at one end. When inflated, the bag draws the reel flanges together, exerting a squeezing effect on the wire. After the steel bands are cut and pulled out through the slots, the wire is ready for paying off from a conventional let-off stand. Uniform flange pressure is maintained throughout the pay-off to eliminate kinking, tangling or breaking, thus preventing shutdowns and speeding output.



**Inflating draws reel together, exerts squeeze during pay-off.**

The pneumatic coil lifter affords convenient positioning and handling of the coil from the pallet to the saddle block. It is composed of a tubular metal core with a pneumatic sleeve to grip the inside circumference of the coil and a hoist track. This assembly permits positioning of the wire either horizontally or vertically by means of a trolley riding on a quarter-circle track. When the crane hook is attached to the trolley and the load hoisted, precise balance of the coil allows easy one-man positioning.

The packaged wire has been tested extensively and has been proven successful under production conditions for four years.

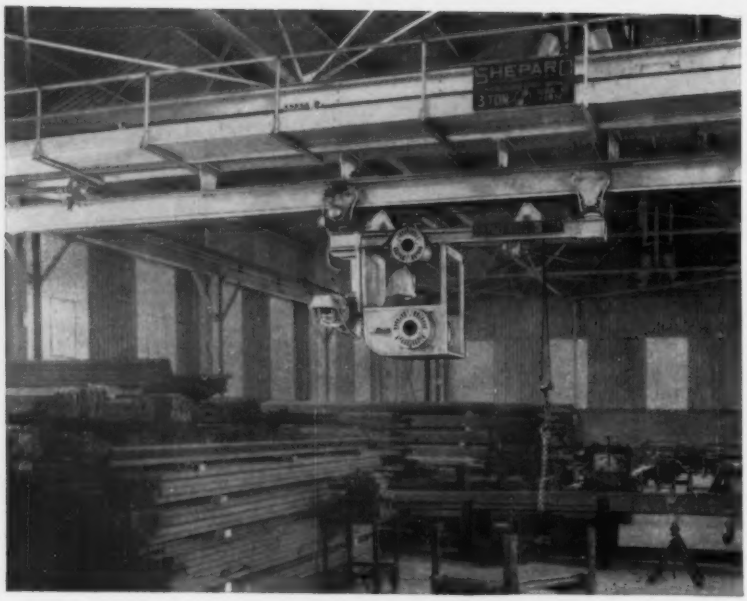
It was developed and is made available through National Standard Co., Niles, Mich.


SHEPARD NILES

Monorail Hoist

# TRANSPORT MATERIALS

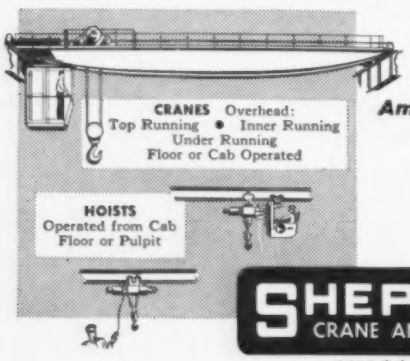
## ...by the most direct route



### WHY MOVE MATERIALS around men and machines?

Transport them directly there, through the air. A Shepard Niles Monorail Hoist and Transfer Crane will put load handling overhead where it will function safely, swiftly, at low cost.

Let us show you the complete line of Shepard Niles hoists available for constant or intermittent service. Choose from light, medium or heavy duty hoists, equipped with either cab or floor controls. Offered in fast, medium or slow speeds.




● Send for latest Monorail Hoist Bulletin . . . ask to have a Shepard Niles representative assist you in selecting a hoist best suited for your plant.

*America's Most Complete Line*

*of Cranes and Hoists*

*Since 1903*

SHEPARD NILES
CRANE AND HOIST CORPORATION

1480 Schuyler Ave., Montour Falls, N.Y.

**Visit Booth 102 Materials Handling Show, Cleveland, June 5-8**

'dag' dispersions . . . *a touch does so much!*

# "Sticky" conveyor problem solved by colloidal graphite lubrication

For a number of years, Whitehall Pharmacal Company, nationally known pharmaceutical manufacturer in Elkhart, Indiana, had lubrication problems with the bucket conveyor to its coal-storage elevator. Pin wear was excessive, due to abrasive coal dust and the corrosive effects of moisture . . . until they tried lubrication with a **'dag'** dispersion of colloidal graphite in mineral oil.

Diluted 1:7 with mineral oil, **'dag'** dispersion No. 2404 is now sprayed on the conveyor links, as shown in the photograph, at two-week intervals. The compressed-air jet carrying the dispersion blows away accumulated dirt . . . lets the volatile carrier deposit a microscopic film of graphite around the pin and link. The resulting *dry lubricating film* is exceptionally durable, provides effective lubricating action, and inhibits corrosion. Whitehall reports that maintenance expense for the conveyor has been drastically cut and down-time all but eliminated.

**'dag'** dispersions are ideal for conveyor lubrication since they resist abrasion, provide lubrication under extreme pressures, and are not affected by high temperatures. They are suitable for application by automatic oilers and mist lubricators.

Write for more information, contained in Acheson Bulletin 423.

*100th Anniversary*

1851—SILICON CARBIDE
1895—SYNTHETIC GRAPHITE
1906—COLLOIDAL GRAPHITE

**ACHESON COLLOIDS COMPANY**
**PORT HURON, MICHIGAN**
. . . also Acheson Colloids Ltd., London, England

ACHESON COLLOIDAL DISPERSIONS:
Graphite • Molybdenum Disulfide • Zinc Oxide • Mica and other solids

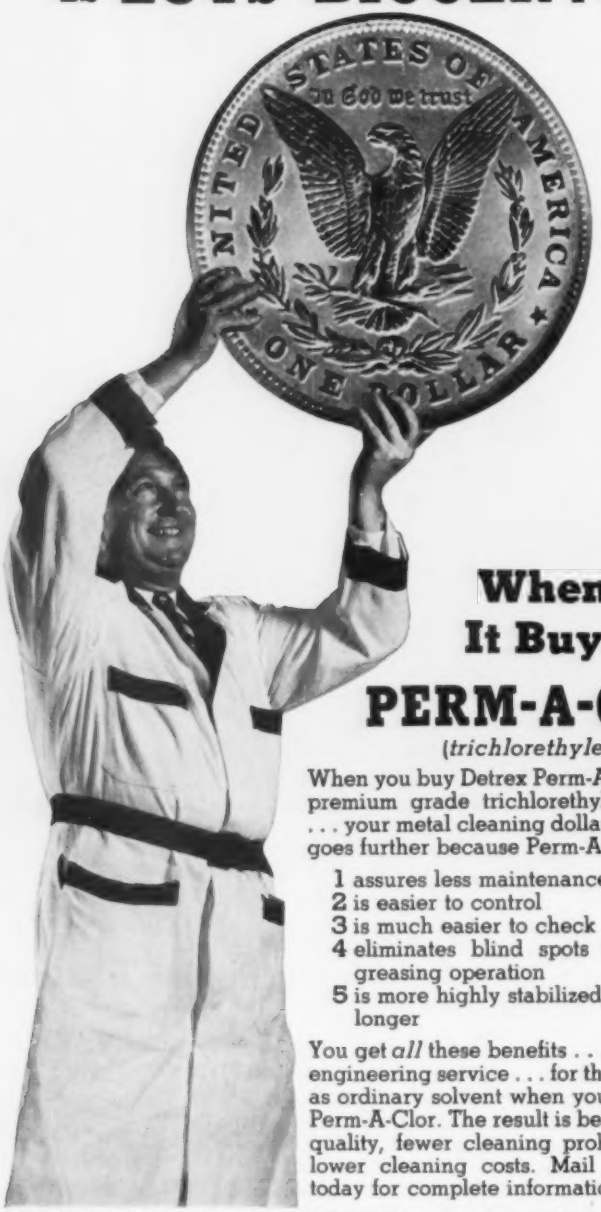
'dag' and 'Aquadag' are registered trademarks of Acheson Industries, Inc.

**ACHESON COLLOIDS COMPANY**
**Port Huron, Michigan, Dept. D-5**

Yes, I want to get your free bulletin describing **'dag'** Dispersions for High Temperature Lubrication.

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____

# Your Metal Cleaning Dollar Is LOTS BIGGER . . .




## When It Buys PERM-A-CLOR

(*trichlorethylene*)

When you buy Detrex Perm-A-Clor . . .the premium grade trichlorethylene solvent . . . your metal cleaning dollar is bigger—goes further because Perm-A-Clor:

1 assures less maintenance cost
2 is easier to control
3 is much easier to check
4 eliminates blind spots in your degreasing operation
5 is more highly stabilized, thus lasts longer

You get *all* these benefits . . . plus skilled engineering service . . . for the same price as ordinary solvent when you buy Detrex Perm-A-Clor. The result is better cleaning quality, fewer cleaning problems, much lower cleaning costs. Mail the coupon today for complete information.

☐ Send me complete information on Detrex Perm-A-Clor.

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## Handling:

### Specially designed racks accommodate auto engines

Highlighting the material handling operations at one automotive plant is an efficient fork truck container system which has been specially designed for fast, effortless handling of incoming parts and materials, in-process parts and completed assemblies.

Typical of these operations is the handling of bulky engines. Uniquely designed racks accommodate four engines which when loaded weigh about 3000 lb.

The racks are designed with runners to ride conveyor lines and with tiering lugs for high

**Racks are designed with runners to ride conveyor lines.**

stacking with 6000 lb capacity for trucks. The conveyors in addition to being a transporting media also act as a temporary storage bank for the racks until the trucks are available to remove them. Cubic storage areas are utilized for more permanent storage prior to shipping.

The installation, described by Elwell-Parker Electric Co., is the Utica, Michigan plant of the Studebaker-Packard Corp.

## Materials:

### Plastic film recommended for wrapping machine parts

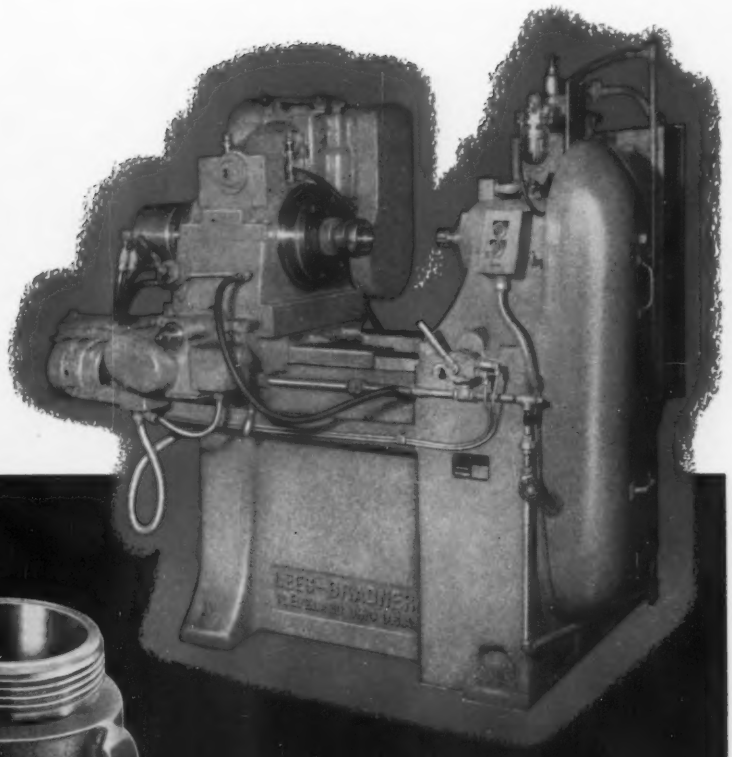
A new clear plastic film—for packaging everything from acid to precision machine parts in tough heat sealable bags—has been announced.

The new film is described as the first durable plastic packaging ma-

'dag' and 'Aquadag' are registered trademarks of Acheson Industries, Inc.

City _____ Zone _____ State _____

# It took this HIGH-SPEED Heavy-weight to lick this tough job!




The Lees-Bradner Special High Speed Thread Milling Machine

The Lees-Bradner Special Thread Milling Machine really shows its class when it works with brass!

The Akron Brass Manufacturing Company of Wooster, Ohio produces these threads, internal and external, each in 13 seconds with a 5000 RPM cutter spindle speed.

This is just one example of the many threading jobs that the modern, high speed, Special Thread Milling Machine can do better, faster and with unmatched precision.

Write The Lees-Bradner Company for full information on this remarkably versatile machine.

**DETAILS ON THIS JOB**

Hob Spindle Speed, 5000 R.P.M.
*(Using a high speed cutter spindle)*

Thread Pitch
(internal and external) . . . 7½

Thread Diameter . . . . . 3"

Length of Thread . . . . . ¾"

Threading Time . . . . 13 seconds

Material . . . . . Brass

Weight of Parts
Internal thread . . 1 lb. 13 oz.
External thread . . 2 lb. 10 oz.

the LEES-BRADNER Company

CLEVELAND 11, OHIO • U.S.A.

terial which exhibits the strength and resistance to oil found in polyester films and the resistance to corrosive fluids and the heat sealable properties of polyethylene films.

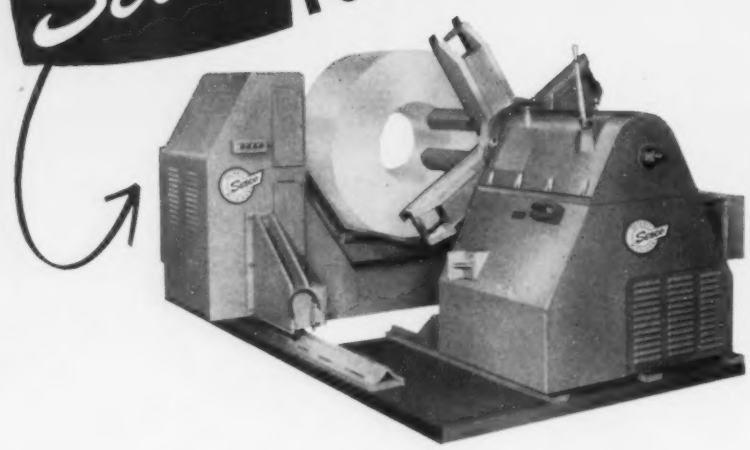
It can package "an exceptional variety of items including most lubricating and food oils and oil based products, cosmetics, drugs and corrosive chemical agents," the Minnesota Mining and Mfg. Co. stated.

The film is chemically inert and non toxic, and has "excellent resistance" to boiling and moisture and gas permeation. It also exhibits "good" puncture resistance and can be used for dry or wet packaging of machine parts with critical surfaces—such as bearings, engine parts and gears.

It is heat sealable—with a bond stronger than the film—at 275 to 350°F at 10 to 60 psi jaw pressure with a half to two seconds dwell.

**Pre-sealed at one end, sleeve is filled and heat-shut.**


Sesco Power-Lift Loader



**IT'S A REAL PRODUCTION BOOSTER.**

It will reduce, to a minimum, the downtime for re-loading coil stock. It can be loaded, without interfering with production, whenever your cranes are not busy.

**IT'S OF RUGGED CONSTRUCTION.**

Its rugged construction will insure long operating life. It's mounted on rails to permit lateral movement. And, its compact design eliminates the necessity of a pit.

**IT'S EASY, PUSH-BUTTON LOADING.**

The coil is elevated to obtain core alignment; and then, it is transferred, laterally, on to the arms of the centering reel. The complete movement of the coil—both lateral and vertical—is by electrical power, and, is push-button controlled.

**MODELS FOR MULTIPLE COILS, TOO.**

Model shown is for loading a single coil. We can build to your specifications, to handle coil weights up to 40,000 pounds.

Sesco INC. 8881 Central Detroit 4, Mich.

engineers & manufacturers of machine tools and press room equipment


## Acid Delivery:

### Tanks elevated on truck for gravity feed to bath

Delivery of sulphuric acid from outside storage to acid baths and reserve bottles inside the plant are handled at one copper mill with 6000-lb. capacity platform trucks. These trucks accommodate special tanks holding 150 gallons of acid—the equivalent of 12 carboys or 2300 lb.

After the tanks are filled from outside storage, deliveries are made throughout the plant. Acid is transferred to the baths or reserve bottles by elevating the tank on the truck's platform and gravity feeding the acid through a hose.

#### Used in Checking Scales

Another unique use of the trucks at this firm—American Brass Co., Buffalo, N. Y.—is in the checking of scale accuracy. The plant has 35 scales which must be checked once or twice a week. Ordinarily, weights are removed from a skid box, the scale checked, and the weights returned to the container.

American Brass shortcuts this procedure by having automatic platform trucks handle skid boxes filled with weights of known value. These weighted boxes are deposited on the scale and an accurate reading is obtained.

The trucks are manufactured by the Automatic Transportation Co., Chicago.

**See the new Saw from C-B Tool Company**

**IT WEIGHS LESS, COSTS LESS, WORKS BETTER**

***The C-B Tool Co. Story***

It was easy! Engineers from C-B Tool Company, Lancaster, Pa. and OSTUCO in Shelby worked out a welded steel tubing component to replace a heavy, bulky oil reservoir and to serve as a handle for the new saw. See the difference this makes in the new Lancaster Model 400A chain saw:

- **Saves Cost—$4.25 on each chain saw!**
- **Saves Weight—3 pounds on each unit!**
- **Works better—Saw now has positive, continuous oiling instead of push-button oiling by the operator.**

*Perhaps this story from C-B Tool has a message for you.*

If you have trouble with see-sawing production costs and quality, OSTUCO may have the answer to your problems. Unique single-source service eliminates interplant shipment, reduces error, gives better production control. See about it . . . see OSTUCO! Contact the Shelby office or your nearby OSTUCO Sales Engineer for details.

**OSTUCO TUBING**

*SEAMLESS AND ELECTRIC WELDED STEEL TUBING —Fabricating and Forging*

***OHIO SEAMLESS TUBE DIVISION***
*of Copperweld Steel Company* • ***SHELBY, OHIO***
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**CANADA,** RAILWAY & POWER ENGR. CORP., LTD.

**EXPORT:** COPPERWELD STEEL INTERNATIONAL COMPANY 117 Liberty Street, New York 6, New York

# Conveyors:

## Magnetic-tape control used to discharge packages

A magnetic tape-controlled conveyor system that automatically discharges packages in any desired sequence at from two to 20 stations has resulted in savings of more than $100,000 a year per unit at Air Force supply depots over the country.

Called ASSET—Automatic Selected Station Electronic Timer—the tape-controlled units have been developed and installed by the A. J. Bayer Co., Los Angeles, manufacturers of conveyor systems for industrial use.

Already in operation at seven Air Force bases, ASSET units have reduced time necessary to handle a typical warehouse job from 40 hours—a full work week—to a matter of four or five hours.

Industrial applications foreseen include distribution warehouses, freight terminals, and other materials handling operations.

### Shunting System

The ASSET system is designed for use on transportation-discharge conveyors—that is, for shunting off packages, cartons, boxes or crates from a main conveyor line to a series of branch conveyors.

For example, a main transportation conveyor may carry incoming boxes down one side of a warehouse past various bays and storage areas for different types of

**Magnetic tape control represents scale model of system.**

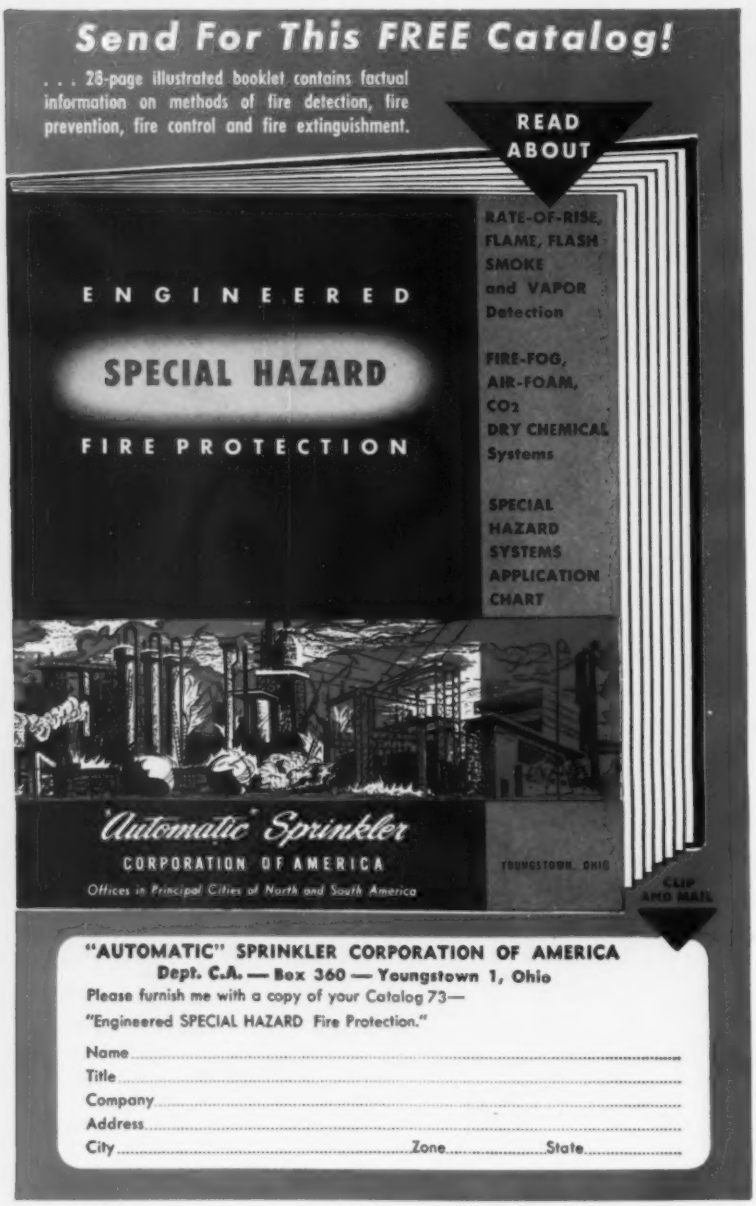
goods. At each bay is a shorter discharge conveyor, branching off at a 90° angle from the main conveyor into that particular bay.

What ASSET does makes it possible for the single operator at the loading end of the conveyor to note the type of goods contained in each package as it approaches, decide to which warehouse area it should go, and then push a selector button for that particular discharge point.

### Beam Interruption Used

The unit goes into action when the moving package interrupts the beam of a photoelectric cell at the side of the conveyor near the operator. It then takes over with its magnetic tape memory and automatically routes each package to the appropriate branch conveyor down the line, precisely centering each package on its conveyor and requiring no attention from the operator other than initially pushing the correct button.

Impulse activates discharge when package reaches branch conveyor.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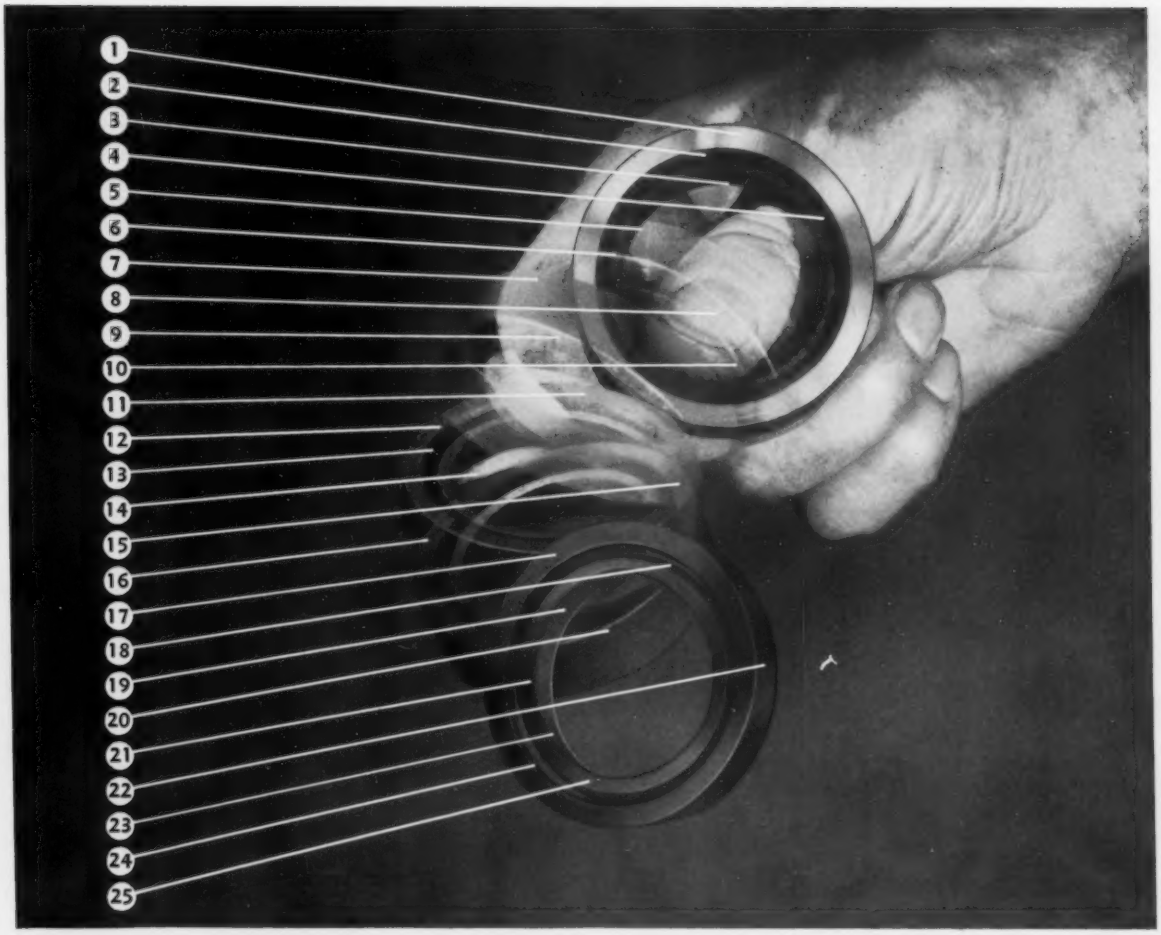



# There are 25 reasons why your oil seals must be custom engineered

Before you buy a "stock" oil seal, ask yourself, "Will this seal suit my requirements?". If it does, it should answer 25 different conditions.

As an example, consider the seal assembly . . . Is the seal to have lip clearance? — Is the seal to be pressed in lip first or heel first? — Is the seal pressed in to a predetermined depth? — Is this a vertical or horizontal application? It is highly unlikely that a "stock" packing can meet all 25 requirements.

IPC custom-engineers every oil seal to suit your specific application. Before you buy, consult IPC. No obligation . . . IPC will show you how to simplify design, reduce cost, and insure long effective service. Technical data sheets outlining these 25 points will be mailed on request.

**INTERNATIONAL PACKINGS CORPORATION**

Bristol, New Hampshire

**BONDED BY IPC**

1. Bonded Washer Seal Double Lip Wiper
9. Bonded Case Seal Straight Lip With Garter Spring
2. Bonded Case Seal Double Lip Wiper
10. Bonded Case Seal Limited Contact Lip With Garter Spring
3. Bonded Washer Seal Straight Lip
11. Bonded Case Seal Straight Lip Thin Rind Type
4. Bonded Washer Seal Limited Contact Lip
12. Bonded Case Seal Limited Contact Lip Thin Rind Type
5. Bonded Washer Seal Straight Lip With Garter Spring
13. Rubber Covered Bonded Case Seal Straight Lip
6. Bonded Washer Seal Limited Contact Lip With Garter Spring
14. Rubber Covered Bonded Case Seal Limited Contact Lip
7. Bonded Case Seal Straight Lip
15. Rubber Covered Bonded Case Seal Straight Lip With Garter Spring
8. Bonded Case Seal Limited Contact Lip
16. Rubber Covered Bonded Case Seal Limited Contact Lip With Garter Spring

**Branch Offices:** Chicago, Dallas, Detroit, Kansas City, New York, Philadelphia, San Francisco, St. Louis.

P3

When you buy *Acme-Gridley*
you get **SERVICE**
***ANYTIME, ANYWHERE***

Tooling for *top* performance is a "must" in today's relentless battle to curb rising costs. Why not profit by performance facts already proved by many users of Acme-Gridley automatic bar and chucking machines.

Our engineers will help you select the tooling best suited to quantity output of new items, or check your present tooling setups against current practices in order to provide lowest production costs possible.

National Acme

The NAMCO nameplate on your machine assures service — in emergency or normal situations — when and where you need it.

THE NATIONAL ACME COMPANY • 175 East 131st Street, Cleveland 8, Ohio

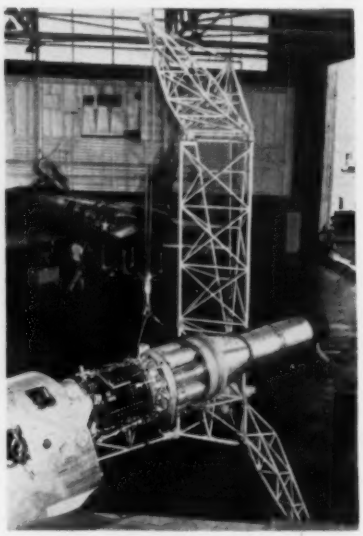

## Aircraft:

### Crane permits changing aircraft parts anywhere

A rugged manual winch with a working capacity of 5000 lb enables one man to replace complete assemblies on planes inside or outside maintenance hangars.

The heavy duty, portable crane has been designed specifically for making rapid engine and heavy aircraft component changes anywhere.

Manufactured by Safway Steel Products, Inc., Milwaukee, the crane was developed in cooperation with the U. S. Air Force to speed up maintenance operations under crowded hangar conditions.



**Accurate loading of engines is handled by one man.**

With the crane, one man can pick up an engine or a wing and quickly move the entire assembly to or away from the aircraft, wherever it may be. By using the easily-operated manual winch, he can accurately control the handling of heavy loads to precision requirements, as in locating and seating an aircraft engine.

This difficult work can be performed at any point inside the hangar or in the open. The crane's large wheels with rubber tires permit towing under maximum load at speeds up to 20 mph.

Although the unit weighs only 2000 lb, its rated capacity is 5000 lb, which has been successfully overloaded to 100 pct at ambient temperatures of −65°F. With its hook clearance of 22 ft, it will accommodate any commercial aircraft. The crane safely carries delicate, fragile parts as well as heavy or bulky components.

# Auto Industry:

## Trucks use same attachment to handle pallets, drums

Modern methods of materials handling have speeded many operations 30 to 40 pct, cut materials handling costs and helped the company meet tight production and delivery schedules at the Packard Motor Car Co.'s Utica, Mich., engine plant.

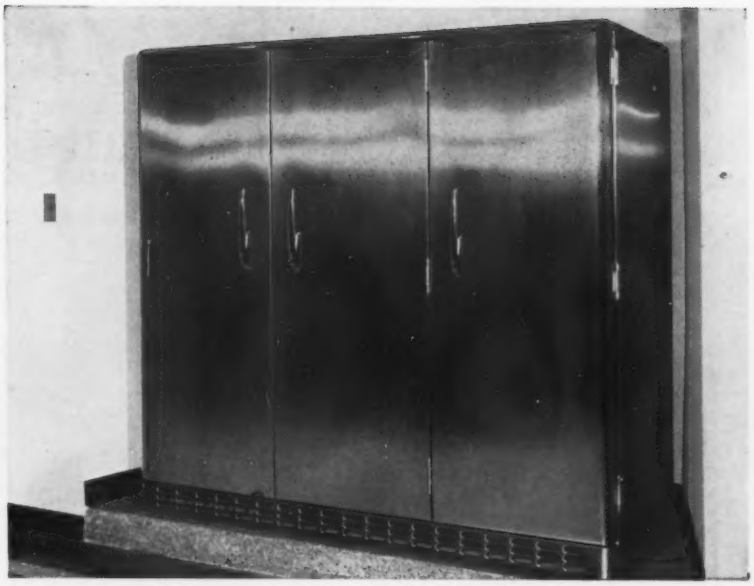
The new handling "techniques" which have brought significant man-hour savings and other important economies to the Packard Div. of Studebaker-Packard Corp. include the use of the same fork lift trucks and the same fork attachments for the handling of pallets and drums.

### "Double-Duty" Handling

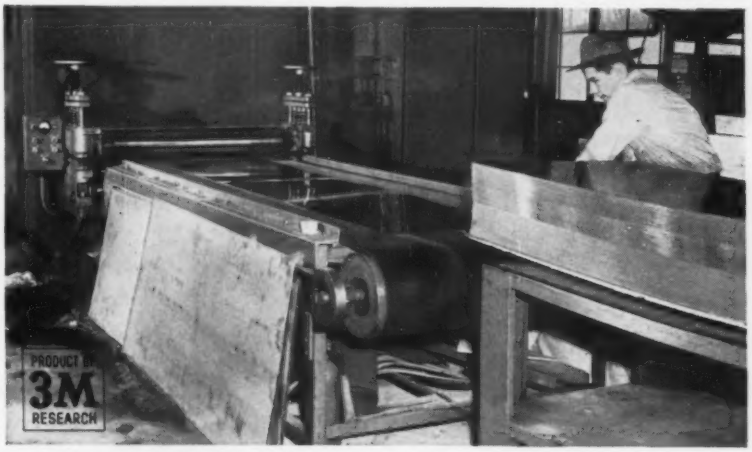
Hundreds of drums of cutting and cooling oil required for machining operations, plus thousands of palletized motor parts including heavy engine blocks, are handled daily. Efficient "double-duty" handling of these two items is accomplished through the use of "slotted" forks attached to fork lift trucks manufactured by Towmotor Corp., Cleveland, Ohio.

Packard's unified system eliminates the need for special lift trucks equipped with clamp arm attachments for handling drums; or the need for inter-changing accessories to handle two different types of load with the same equipment.

At the plant, all loads with the exception of oil drums are received palletized. Palletized materials, including a variety of engine parts from other plants and suppliers, delivered to the plant by highway truck, are unloaded by fork lifts equipped with notched forks.

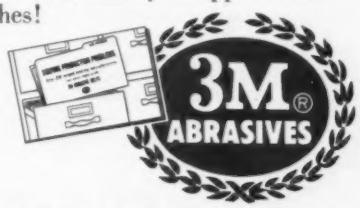



**PROBLEM** Victory Metal Mfg. Corp., maker of commercial refrigerators, uses coated abrasive belts to surface-polish 18-8 stainless steel sheet stock from its standard 2B mill finish to a #4 finish. With Brand "X" Belts, costs per polished sheet were high.




**ANSWER** A 3M Representative suggested that this Plymouth Meeting, Pa., firm switch to 3M Abrasive Belts — Grit #80 Three-M-ite Cloth for rough grinding, Grit #150 Tri-M-ite Resinite Cloth for polishing. Cost per sheet for polishing operations immediately dropped substantially, with superior finishes!

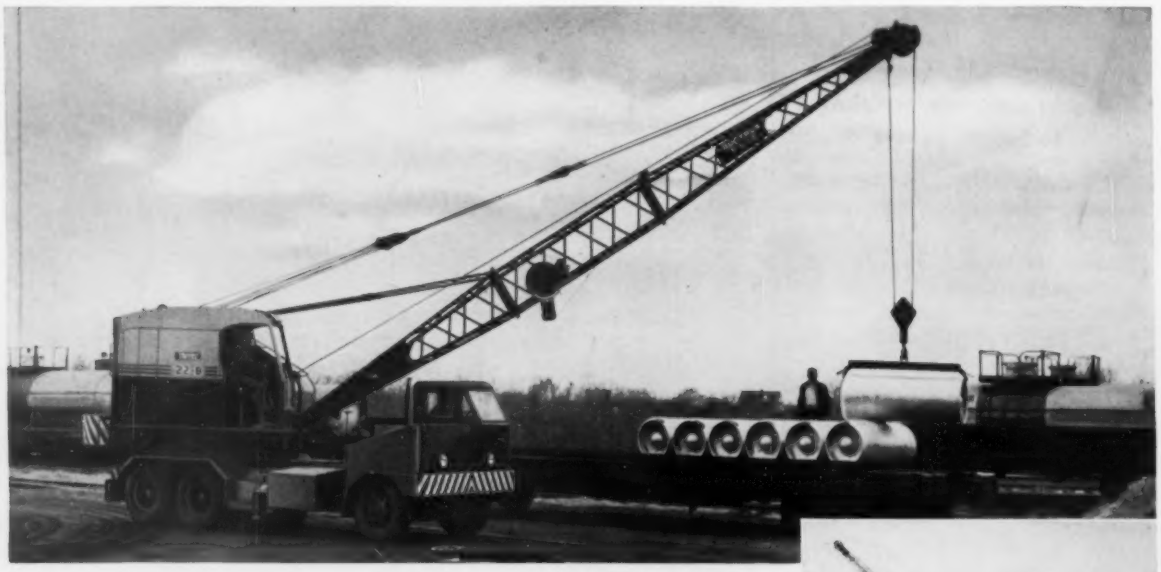
***Your 3M Representative*** can help *you* cut costs and increase production, too. Call him today. Or write Minnesota Mining and Manufacturing Co., Dept. DD-56, St. Paul 6, Minn., for FREE booklet: "Case History Reports on 3M Abrasive Belts".




Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P.O. Box 757, London, Ontario. Export Sales Office: 99 Park Avenue, New York City. Makers of "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip surfacing.

# One of these 22-B Cranes Answers YOUR Handling Needs

Whether you are handling materials in widely scattered locations, over difficult terrain, or in close quarters, there is a Bucyrus-Erie 22-B crane which will do an outstanding job of handling your particular situation. Each has the power, long reach, and solid construction that help you save money through efficient, long-term service. 253E56



**22-B TRANSIT CRANE**

## *Reach and Mobility*

Combining heavy-duty lifting crane features with rubber-tired mobility, the 22-B Transit Crane handles booms from 30 feet (standard) to 80 feet (with removable inserts), has lifting capacity of 25 tons. Job-to-job moves are fast and convenient.

## *Heavy Work*

**HEAVY-DUTY 22-B CRANE**

An outstanding performer wherever extra strength and stability are vital, the Heavy-Duty 22-B has high maneuverability on rough or soft terrain. It is equipped with a 35-ft. boom, extendible to 70 feet through use of inserts. Long, flat crawlers with 30-in. treads, friction swing brake, power controlled lowering for the main hoist line, and telescopic pipe boom stops are only a few of its many features.

## *General Service*

**22-B CRANE**

For a variety of jobs requiring highly dependable service, the standard 22-B crane can't be topped. Carrying a 35-ft. boom extendible to 70 feet, this machine has high maneuverability and great stability as well as independent power boom hoist and many other features you ordinarily find as optional equipment on other cranes.

For complete information on any one or all of these models, see your local Bucyrus-Erie distributor or write direct.

**BUCYRUS-ERIE COMPANY**

**South Milwaukee, Wisconsin**

# THE ELI WHITNEY METROLOGY LABORATORY

## *Your NEW Auditing Source For Dimensional Standards*

For a more comprehensive account of the facilities and capabilities of the Eli Whitney Metrology Laboratory, request Bulletin ML-1-56 from The Sheffield Corporation, Dayton 1, Ohio, U.S.A., Dept. 8.

**American industry now has a new auditing source for dimensional standards at all precision levels.**

**In a maximum controlled environment—using instruments similar to those of the leading national standards laboratories of the world, the Eli Whitney Metrology Laboratory offers the following services:**

**❶ Calibrate and Certify:**

- Dimensions of gage blocks, mechanical components and fixed size master gages including thread gages and threaded parts.
- Flatness and surface finish of optical true planes.
- Material hardness.
- Fineness of textile fibers.
- Circularity and graduations of precision circles—also circularity of manufactured components.
- Boundaries of contoured masters.

**❷ Provide a counseling service** for the development of industrial dimensional control and gage surveillance programs.

GOLDEN ANNIVERSARY

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manufacture and measurement for mankind

7482

Want Lower Material Handling Costs?

# GET A STRAYER ELECTRIC CLAMSHELL BUCKET BIGGER, FASTER PAYLOADS WITH EVERY PASS

AC or DC, Continuous or Hook-On Service

*Strayer Electric Buckets have an almost unlimited range of applications. They can be used whenever there is electricity, inside or out-of-doors. You can attach them to any type of power hoist or crane.*

You'll get lower material handling costs with a Strayer Electric Bucket. Design and construction assure you of that.

Strayer's well-known design uses the enormous closing power of lever arm action plus a terrific boost with electric drive. Usually loads are greater than rated capacity. This power to dig-in never lets a Strayer Electric lift out empty. You get a full load with every bite.

From top to bottom, the Strayer is strongly built for long, steady use, even under extreme conditions. It requires very little service.

*Check these features. They're only a few of the reasons why Strayer Electric Buckets mean lower material handling costs.*

- Operates in its own headroom.
- Empties full or part load.
- No clutches, chain or leaf springs.
- Crane with lifting magnet needs no extra wiring.
- Wide scoops make it clean up as well as digging bucket.
- Automatic controls prevent accidental opening or closing.
- Smooth, steady action. No sudden shock thrown on crane.
- No blind rivets. Generous size bushings and hinges.
- Hooks on or off in a minute.
- Digs full or part load.

Erie Mechanical Hook-On and Two-Line Buckets Also Available in a Complete Range of Sizes

For catalogs, write Dept. A56

ERIE
BUCKETS THE WORLD OVER

**ERIE STRAYER CO.**

556 GEIST ROAD • ERIE, PENNSYLVANIA

CASE HISTORIES

## Scrap Handling:

### Crane doubles up duties, loads scrap and furnace.

When considering the question of handling scrap from the storage yard to the cupola, a New England malleable iron foundry decided to get double-duty from one piece of equipment.

It's a battery powered, 6000-lb capacity mobile crane with an electro-magnet which moves some 200,000 lb of scrap daily. The unit is manufactured by the Elwell-Parker Electric Co., Cleveland.

Part of each day is spent in the yard loading skid boxes with scrap while the rest of the time is spent in loading the side-dump bucket that feeds the cupola charging skip.

**Loads Cupola in Day**

After finishing cupola charging, usually in the late afternoon, the vehicle moves outside to begin loading skip boxes for the next day's charge. About 20 boxes make up a charge and each box takes about 10,000 lb.

As soon as boxes are loaded, a 10,000-lb capacity low-lift platform truck moves them inside and positions them in a semi-circle around the spot from which the crane truck will operate. In this way, the crane has access to all boxes and the dump bucket without moving from the spot.

**Dual Control Set-Up**

In the morning, the crane moves into position and the operator plugs the control cables for the dump bucket into the back of his cab. Thus he can control both his own crane and the movement of the dump bucket from within the cab. At the same time, a battery charging unit located in back of the crane is plugged in and the crane's batteries are charged during the in-plant operating hours.

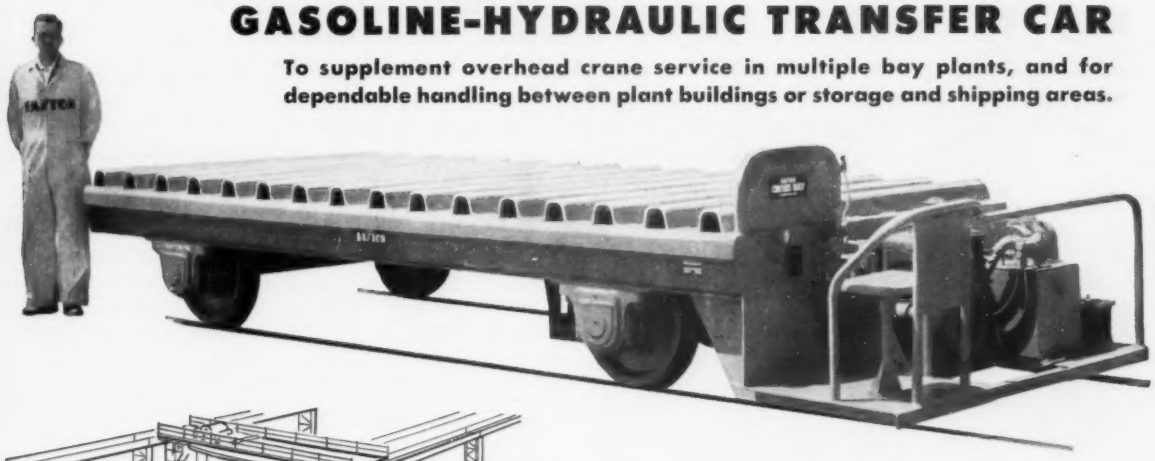
Since the crane is at work on the charging floor about eleven hours per day, it is necessary that the battery receive additional charge to insure ample power when crane returns to yard.

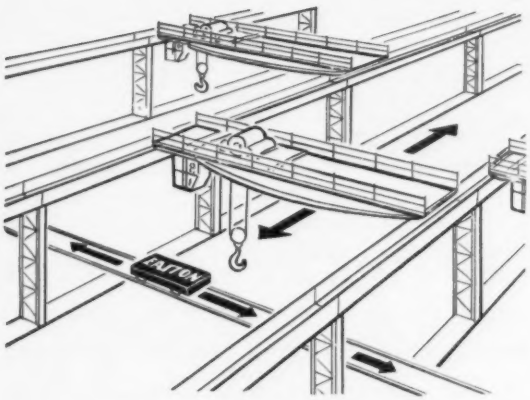
NEW

# CROSS-BAY®

## GASOLINE-HYDRAULIC TRANSFER CAR

**To supplement overhead crane service in multiple bay plants, and for dependable handling between plant buildings or storage and shipping areas.**

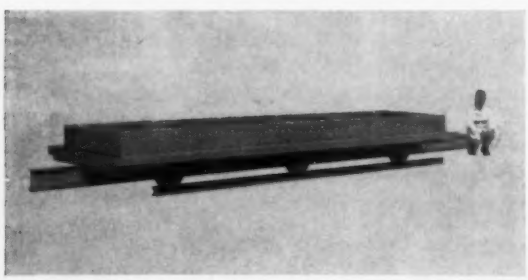




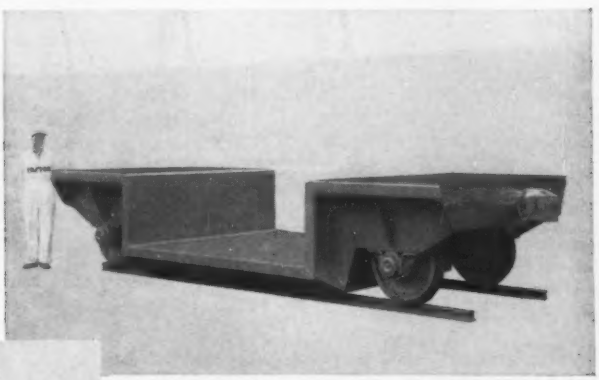

EASTON CROSS-BAY CARS are custom-built to meet speed and capacity requirements. Special superstructures can be designed for specialized or mechanized handling. The gasoline-hydraulic Cross-Bay Car illustrated above was built for steel warehouse work. It provides a capacity of 25 tons plus 50% for impact loading, and a two-way speed of 50 feet per minute.

In addition to the gasoline-hydraulic car shown above Easton Cross-Bay Cars may be powered by electric motor, electro-fluid drive, gasoline-electric drive or storage battery. Capacities from 5 to 500 tons. Controls may be manual, electric (by push-button on the car or remote station) or electronic.

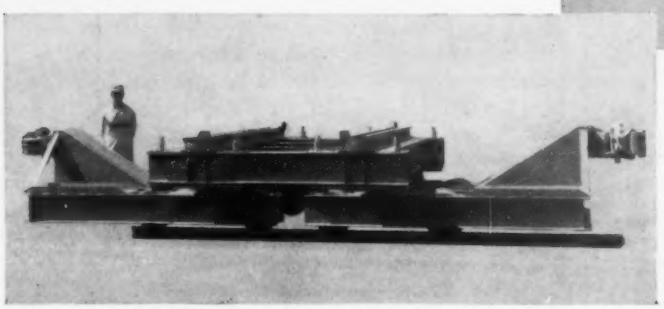
## SEE EASTON FIRST FOR CUSTOM-BUILT CARS FOR INDUSTRY



Annealing Furnace Car Equipped with Rack Beam ▲



▲ Split-level Platform Car—Capacity 50 tons



◀ Double-truck Transformer Transfer Car —Capacity 150 tons

A-1049

**EASTON®**

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

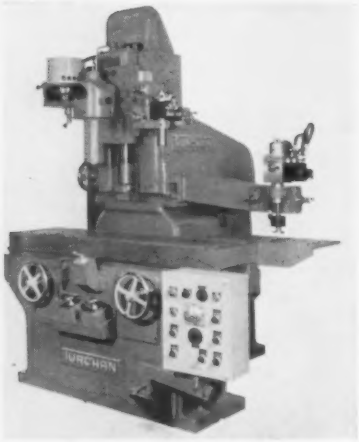
# NEW EQUIPMENT

**New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 181 or 182.**

## Sand muller utilizes speed and thoroughness

Used in shell moulding and shell core blowing, this sand coating muller is designed for rapid and thorough coating or blending of dry foundry sands with dry or liquid phenolic resins. For cold coating the sand and resin are first mixed dry in the muller. Then a wetting agent such as alcohol and water is automatically sprayed into the mixture from a top mounted tank. The entire cold-coating cycle lasts 12-15 minutes. Dry washed sand with AFS fineness of 80-130 mesh is used. Resin proportion is one to four pct depending upon the fineness of sand used and shell strength required. For liquid coating resin is added to the sand through the loading door while the muller is operating. Cycle time is 12-15 minutes. After coating, materials are dried under compressed air introduced through a blower. Sand is discharged through a bottom door, and is ready for immediate use in storage. Mullers come in three sizes with 125, 300 and 1000 lb capacities. While the muller is specially designed for use with shell moulding sands, it is also suited for mixing of oil sands or Green sand facings. *Shallway Corp.*

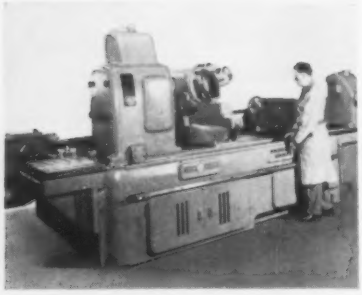
**For more data circle No. 44 on postcard, p. 181**




## Heavy cuts accurate with automatic die sinker

A fully automatic bed type die sinker is of solid cast iron construction, well ribbed and reinforced to handle the heaviest cuts and maintain accuracy. Equipped with a magnetic tracer, the new machine can be operated three different ways. It is primarily a fully automatic die sinker but can also be used as a power operated straight milling machine or as a hand operated straight milling machine. These three methods of operation are selected on the central knob of the control panel. When on fully automatic the operator can set the stroke length to cover the workpiece and select the index or pickfeed desired at the end of the cut. As the machine coordinates the vertical movement of the cutter with table and ram movements to reproduce the profile of the master model accurate, electric limit switches control adjustment of stroke length on table and ram. Another tracer control is used for centering. Table has extra long guide ways. *Turchan Follower Machine Co.*

**For more data circle No. 45 on postcard, p. 181**



## Largest rotary gear crown-shaver is unveiled

Previously the largest gear in the world that could be crown-shaved measured 36 in. between centers. However, a new 48 in. rotary gear shaver that expands the field of crown shaving to include external gears up to 48 in. pitch diam and 62 in. between centers is now available. Spur and helical gears up to 12 in. wide and 52 in. OD in the 2-16 diam pitch range can be crown shaved on the huge machine. Shavings without crowning can be done on spur and helical gears up to 36 in. wide and 142 in. between centers in the same tooth size range on the machine. Uses manual or automatic cutter feed. *National Broach & Machine Co.*

**For more data circle No. 46 on postcard, p. 181**

## FOR RESISTANCE TO WEAR, CORROSION AND HIGH FLUID PRESSURES, SPECIFY ALUMINUM MANGANESE BRONZE (our trade name: HY-TEN-SL)

This "exclusive" alloy is extremely strong, tough and hard—yet ductile. It is 6% to 8% lighter than other Bronzes (excepting aluminum Bronze) —and is readily machined.

We offer this unusual metal in Castings; Hot Rolled Rods & Bars—and Forgings.

Send for complete data sheets giving information on: Wear Resistance, Corrosion Resistance, Pressure Resistance, Fatigue Resistance, Effect of High Temperatures, and Machining instructions.

**Note: We make all types of *Bronze Casting Alloys*—Send for new 48 page Catalog giving composition, characteristics and applications—It's *free* upon request on your Business Letterhead.**

## AMERICAN MANGANESE BRONZE COMPANY

**4701 Rhawn St., Holmesburg, Philadelphia 36, Pa.**

***Established 1909***

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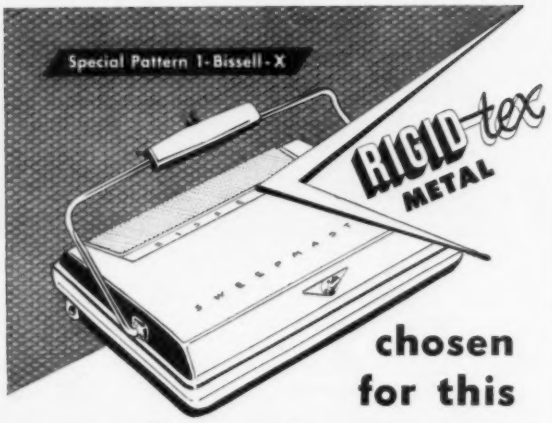


## chosen for this award winning design

RIGID-tex Metal adds a decorative touch to the modern styling of this sweeper, chosen to be displayed in the Good Design Exhibit, New York Museum of Modern Art.

Its mar-resistant beauty gives a product distinctive identity, taking it out of the "look-alike" class.

RIGID-tex Metal is produced in over 40 standard patterns, in any metal, finish or color. Exclusive patterns like that used above can also be developed.

*See Sweet's Design File 1a/Ri or write us for information.*

RIGID-tex METAL IT'S RIGIDIZED

**RIGIDIZED METALS CORP.**
**6695 OHIO STREET BUFFALO 2, N. Y.**
*Sales Representatives in Principal Cities*

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**NICE BALL BEARING COMPANY** produces complete lines of precision, semi-precision and unground standard and special bearings. Hence, NICE field and factory engineers offer the advantage of a diversified product and experience . . . and are well qualified to recommend or design the economically and FUNCTIONALLY CORRECT bearing for your particular application.

*Write for* NICE *New Catalog No. 150*

## NICE BALL BEARING CO.

NICETOWN • PHILADELPHIA • PENNSYLVANIA

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## LEXCO HYDRAULIC LIFT TABLES

### SAVE MONEY — TIME — ENERGY

Lift heavy castings, dies, machine accessories and other heavy articles — Use as adjustable work bench — Welder's positioning table — Leveling Table for Presses, conveyors, loading trucks, etc.

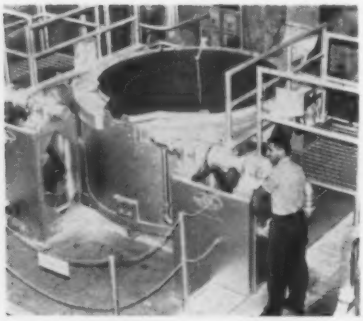
- **A new specially engineered method to give hydraulic power and ease. Table capacity 2000 lbs.—Hydraulic unit 3000 lbs.**
- **Model shown is 30" long by 20" wide by 30" overall height with an 18" raise to 48" overall height — hand pumped. Lowered fast or slow with simple release valve.**

**$187.** F.O.B. LINE
LEXINGTON, PA.

**Write For LITERATURE & PRICES ON OTHER MODELS Foot & Hand Operated**

## LEXCO ENGINEERING & MFG. CORP.

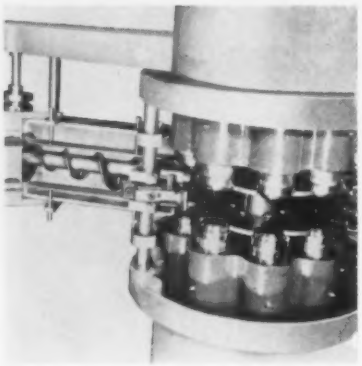
**P. O. BOX 169, COLMAR, PA.**



## Metal furnace built with 25,000 lb capacity

A nose-tilting type Kirksite Melting Furnace has been built with 25,000 lb capacity. It is 76 in. in diam and 37 in. deep. The nose-tilting feature eliminates the necessity of a deep pit since the ladle rests on the same floor level as the furnace. This melting furnace is of such great size as to remelt large obsolete scrap dies without cutting up the dies first. The furnace has remelted as much as 200,000 lb of obsolete scrap dies weighing 18,000 to 19,000 lb each in four days. An 18,000 lb die has been melted in 3½ hrs when placed into the pot containing 7000 lb of melted metal. Once 6 C hammer dies 48 in. square were loaded simultaneously. Ten ton dies have been poured. *Bellevue Industrial Furnace Co.*

For more data circle No. 47 on postcard, p. 181

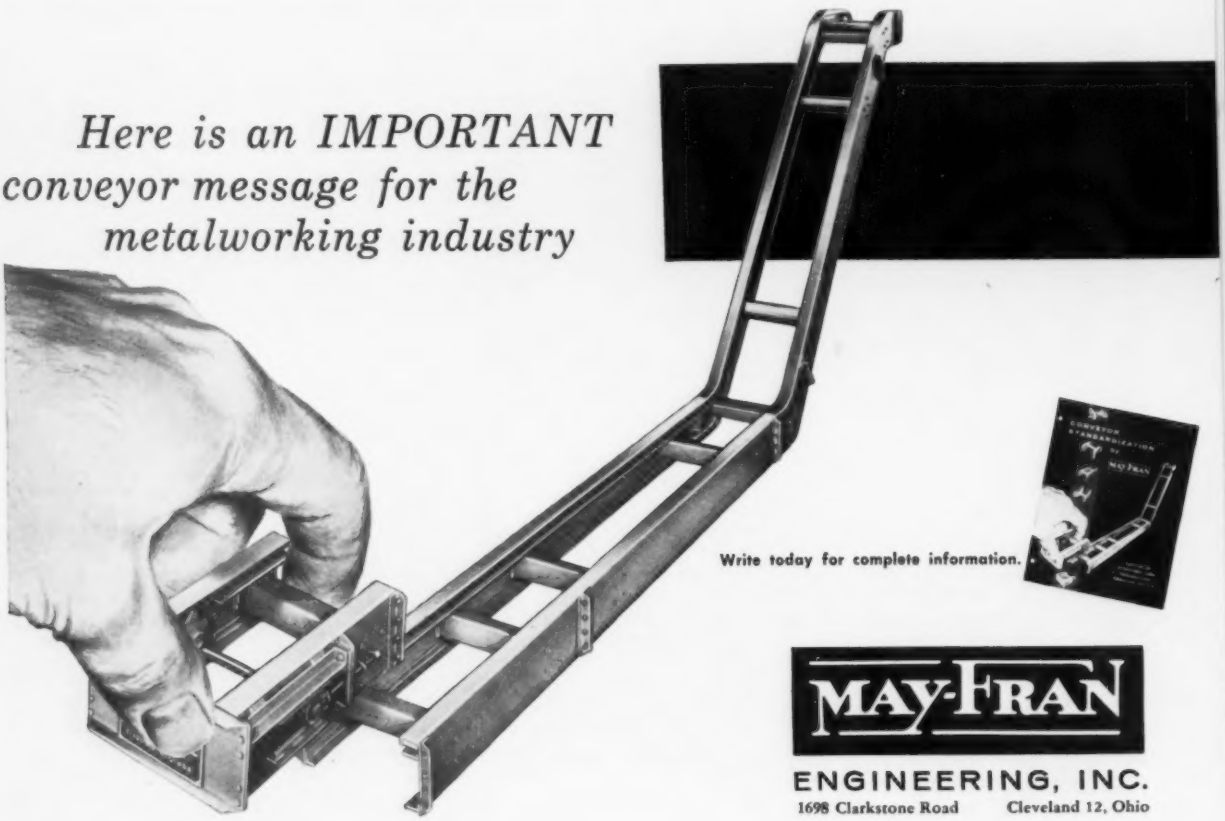


## Feeder handles 500 can bodies per minute

A new spiral-type feeding mechanism accurately locates can bodies in a flanger at extremely high rates of speed. It was designed for use with a fast new flanger which operates at better than 500 cans per minute. The feed eliminates the tendency of can bodies to "cock" or "mis-locate" when gravity fed at high speed. It positively locates bodies in the flanging turret. The spiral on this feed is the accelerated type to separate the cans and is chrome plated and polished to prevent damage to can bodies. It is capable of feeding several different can sizes. This design feature enables one or two spirals to handle the variety of sizes found in many modern plants. Timed with the flanger, it is equipped with a safety overload coupling. *E. W. Bliss Co.*

For more data circle No. 48 on postcard, p. 181

*Here is an IMPORTANT conveyor message for the metalworking industry*

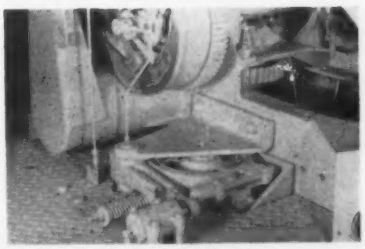


Write today for complete information.



MAY-FRAN
ENGINEERING, INC.
1698 Clarkstone Road Cleveland 12, Ohio

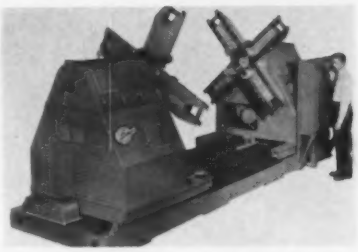
## Friction type swing brake has hydraulic control



Availability of a hydraulic-control, friction type swing brake on all shovel-cranes in this company's line has been announced for crawler and rubber-tired cranes, in ½ to 3 yd digging capacities. Used in operations calling for precision spotting of loads, the brake allows an operator to hold the boom in any desired position by fingertip control. Location of swing brake eliminates possibility of oil or grease getting on the brake lining and provides easier accessibility. *Link-Belt Speeder Corp.*

For more data circle No. 49 on postcard, p. 181

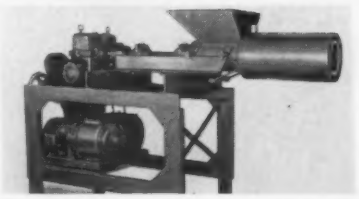
## Coil handler does easy, trouble-free loading



Coil weights up to 40,000 lb can be handled by a new device for metal-working presses. This "Twin-In-Action" coil handler is built of standard components and is fully powered. The coil is picked up on the ID by four radially contoured expander arms. According to the maker, the arms design permits trouble-free, easy loading with gentle handling, irrespective of weight. Each reel can be laterally adjusted independently or in unison for easier alignment with press or die. *Sesco, Inc.*

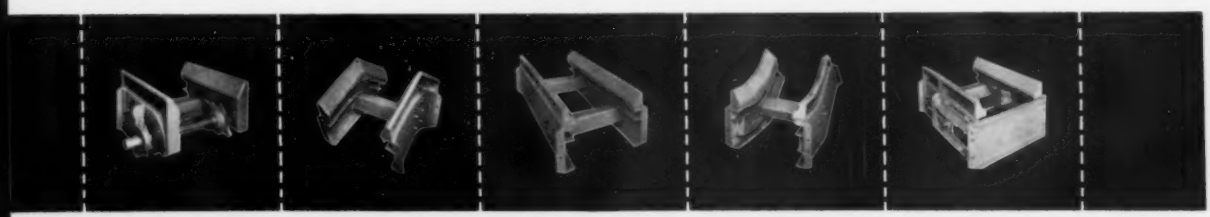
For more data circle No. 50 on postcard, p. 181

## Charges materials with or without water



An unusual feeder-conveyor for charging materials into a furnace with or without water cooling, this machine has an adjustable base for height. The collector at the top is designed to receive materials by gravity from a hopper above. Its jacket, the end of which is placed next to the door of the furnace, is water-cooled. *Klaas Machine & Mfg. Company.*

For more data circle No. 51 on postcard, p. 181

**NOW YOU CAN ASSEMBLE YOUR OWN "CUSTOMIZED" CONVEYORS FROM PRE-FABRICATED STANDARD SECTIONS.**

If your plant produces stampings, formed metal parts, castings or forgings . . . if you have a byproduct such as automotive scrap, chips and turnings . . . the MAY-FRAN conveyor standardization program will provide your company with savings never before possible.

Through standardization, MAY-FRAN now makes it possible to assemble individual components into virtually any type of conveyor to handle a wide range of products or materials. Straight sections . . . concave or convex sections . . . take-up charge sections and discharge-end sections can be furnished to meet specific requirements of belt width as well as load bearing and volume capacities.

Even after they are installed, MAY-FRAN conveyors can be dis-assembled and re-assembled in other plant locations . . . to handle other products. Standardized conveyors can be lengthened, shortened or modified in almost any way . . . and at minimum cost.

Pre-fabricated conveyor sections can be furnished rapidly and inexpensively. The individual components provide users with the ultimate in flexibility. MAY-FRAN hinged-steel conveyor belting is used on the Standardized units. Belting is available in widths from 6 inches to 6 feet in any length. Solid and perforated links are available in pitch lengths from 2½ to 9 inches.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with standardized components for your customized installations.

MAY-MF

IN ADDITION TO ITS REGULAR LINE of precision gears, one of New England's oldest and ablest gear-engineering organizations is now fully equipped to produce fine pitch gears to your own specifications. Any size and quantity... any type of basic material, metallic or non-metallic. Complete heat-treating facilities.

Perkins has the equipment, the experience and the craftsmen to satisfy *all* of your custom-made gear requirements.

**YOU FURNISH THE SPECIFICATIONS — WE'LL PRODUCE THE GEARS**

**PERKINS MAKES:** bevel gears, ratchets, sprockets, ground thread worms, helical gears, spiral gears, spur gears-shaved or ground teeth, gear trains and assemblies, speed reducers.

✻ **The PERKINS PRECISION SPRING COILER is the latest development in the spring coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want when you want it — in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire sizes .005 to .125. Diameter, from 3/32" to 12" and larger. Size of the compact coiler is only 7 1/2x16". A POWER MODEL is available. Information on request.**

**PERKINS MACHINE & GEAR CO.**
**103 Circuit Ave., WEST SPRINGFIELD, MASSACHUSETTS**



## Pallet loader

Designed to meet the needs of a producer with a production rate of manual palletizing too low to justify the use of a standard high speed model, this low capacity, fully automatic pallet loader has been produced. It has a capacity of about 20 cartons a minute and can be justified at a capacity of only

five per minute. Handling pallets up to 48 x 48 in. with a maximum load width including overhang of 52 in. and maximum length of 50 in., it may be loaded individually or in stacks. It is equipped with seven electric motors. *Lamson Corp.*

**For more data circle No. 52 on postcard, p. 181**

## Clamshell buckets

Two new groups have been added to one manufacturer's line of clamshell buckets with the addition of ⅜ to 4 yd light rehandlers and ⅜

to 2 yd extra heavy duty hard diggers. Use of equalizer bar arrangement makes possible 3 or 4 line application. *Bucket Division, Erie Strayer Co.*

**For more data circle No. 53 on postcard, p. 181**

# A LIFETIME DIAL INDICATOR

## WITH THE MAINTENANCE-FREE "H" MOVEMENT

NEW

Rugged — shockproof — withstands more impact. Improved life under all conditions. All gears, racks, and pinions precision hardened — friction reduced 16% to 25%, depending upon magnification . . . a new high in sensitivity. Calibrated accuracy greatly improved. Off-white dials and fine line graduations facilitate readings. Available in four sizes. Enthusiastically received in shop tests.

You can get the NEW FEDERAL Dial Indicator:

- In 47 Regular Models (any B, C, D, or E Size Model listed on page 4 of our catalog)
- In 7 Wetproof Models (all Wetproof Models listed on page 6 of catalog)
- In 2 Long Range Models (C8IS and D8IS, shown on page 7 of catalog).

To specify the new style Lifetime Dial Indicator, merely add "H" after Model Number desired. If you don't have the new Dial Indicator Catalog No. 55 and Price List, write today . . .

**FEDERAL PRODUCTS CORPORATION**
**6135 Eddy Street • Providence 1, R.I.**

**FEDERAL'S SOLUTION TO THE COST OF GAGING:**
Impartial Gage Selection
Engineering Follow-Through
Everything in Gages

*Ask* **FEDERAL** *First*

**FOR RECOMMENDATIONS IN MODERN GAGES . . .**

**Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automation Gaging**

Overcoming Headroom Limitations with a LOW HEADROOM TROLLEY

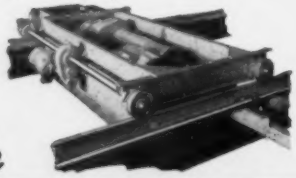
EUCLID CRANE

• Rapid growth of a progressive company necessitated the installation of a larger, more powerful crane.

Headroom limitations prevented the use of a conventional crane without expensive lowering of the runway which would have restricted the working height under the hook.

Euclid engineers solved the problem by incorporating standard units into this compact yet accessible low headroom trolley.

Regardless of your needs for material handling equipment a standard or specially designed Euclid Crane or Hoist will meet the requirements satisfactorily.



Write for Literature

THE EUCLID CRANE & HOIST CO.

1361 CHARDON ROAD • CLEVELAND 17, OHIO

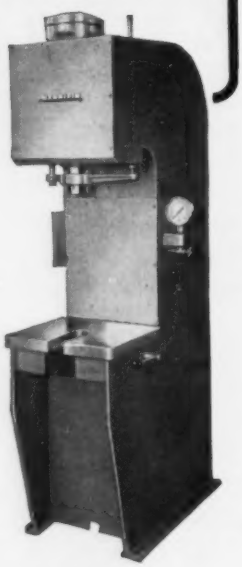


PRICE LIST

ON HANNIFIN STOCK HYDRAULIC PRESSES

| | |
|---|---|
| 1-TON | $ 552 |
| 2-TON | $ 627 |
| 5-TON | $1,306 |
| 8-TON | $1,356 |
| 10-TON | $1,855 |
| 25-TON | $3,401 |

Prices complete with motors and starters F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



DELIVERY FROM STOCK

Demand for these popular presses is so consistent we are able to produce them in quantity and pass the savings along to you.

Construction-wise and quality-wise these small general-purpose presses are identical to the larger Hannifin presses, up to 150 tons. Special, optional controls when needed.

WRITE for complete information on the Hannifin Hydraulic Press you're interested in.

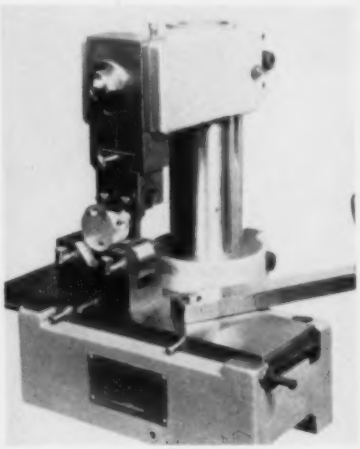
HANNIFIN

HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS




## Marking machines

Marking of either round or flat work pieces not requiring pressure or size capacity of heavy floor model marking equipment can be done on a new line of bench roll marking machines. The first of the series features a hand operated work slide and a mounted rigid die holder head that is vertically adjustable on a round column. This



makes it possible to vary the gap for large or small work pieces. The holder slide is also adjustable for setting depth of mark and for changes in work diam. The die slide has a standard dovetail slot to fit standard holders. Holders can be adjusted. *Noble & Westbrook Mfg. Co.*

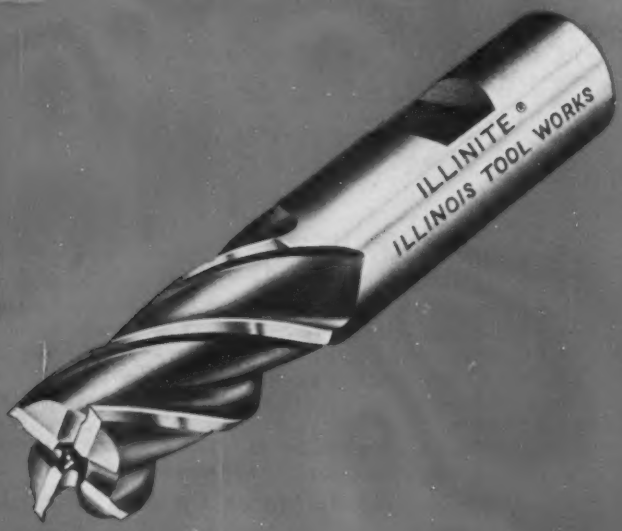
For more data circle No. 54 on postcard, p. 181

## Printable tapes

Printable tapes—made with DuPont's Mylar polyester film—which will enable a manufacturer to advertise his product while sealing or packaging have been made available. Known as Permacel 95 and 951, the pressure-sensitive tapes are referred to as especially suitable for labeling and sealing containers of the many common oils and solvents to which they are resistant. Because of their extreme thinness, Permacel 95 and 951 are not likely to be picked or rubbed off. P95 is a transparent tape. P951 is available in red, black, white, and chrome, a metalized finish. *Permacel Tape Corp.*

For more data circle No. 55 on postcard, p. 181

# NOW...two end tooth styles!



# ILLINITE®

## MULTIPLE-FLUTE END MILLS

Illinite Multiple-Flute End Mills offer you your choice of two end tooth styles. Both cupped-end tooth and full-end tooth designs are available in a wide range of sizes. Products of Illinois Tool Works, end mills marked "ILLINITE" are your assurance of the finest in metallurgy, design, and precision craftsmanship. They're in stock, no farther away than your telephone.

*CALL YOUR ILLINITE DISTRIBUTOR TODAY!*

He carries the complete line of Illinite End Mills for every end-milling requirement.

NOW!

...Special Multiple Thread Milling Cutters available through your local Illinite Distributor.

THE QUALITY LINE FROM...

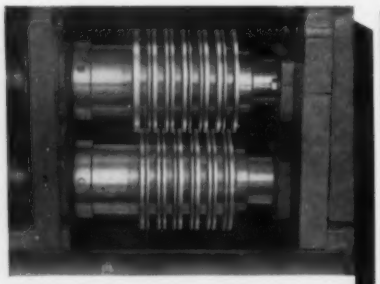
# ILLINOIS TOOL WORKS

2501 N. Keeler Avenue
Chicago 39, Illinois

**ILLINITE...the most complete line of Standard Metal Cutting Tools—available from stock!**

TRI-MILS • END MILLS • MILLING CUTTERS
SLITTING SAWS • KEYSLOT CUTTERS • HOBS
SHAPER CUTTERS • TOOL BITS

# COWLES
## SLITTING KNIVES



**Cut costs 3 ways**

Cowles knives reduce set-up time. They are made so accurately they can be assembled on the arbor without shimming. Cowles knives stay on the job longer;— they reduce down-time for re-grinding; and produce straight edged strip with minimum burr avoiding tie-ups in blanking operations.

For maximum economy and satisfaction order your knives and spacers from Cowles, world's largest manufacturer of rotary slitting knives. Prompt delivery. Complete range of sizes and analyses for slitting high and low carbon steels, stainless, alloys, silicon or non-ferrous metals.

*Engineering Assistance On Any Slitting Job!*

**COWLES TOOL CO.** 2086 WEST 110th STREET CLEVELAND 2, OHIO

*Specializing in the Manufacture of*

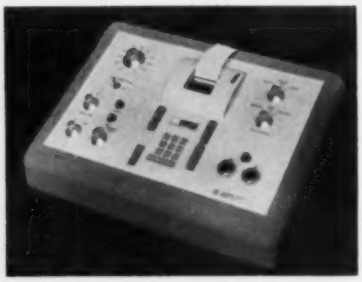
ROTARY SLITTING KNIVES • SPACING COLLARS • GANG TOOLS • EDGING ROLLS • CUT-OFF KNIVES • SEAM GUIDE ROLL FINS • SEAM GUIDES • WIRE DRAWING TOOLS • STANDARD AND SPECIALLY ENGINEERED TOOLS FOR ALL FERROUS AND NON-FERROUS PROCESSING, TRIMMING AND FORMING REQUIREMENTS.

**AMERICAN SHEAR KNIFE CO.**
HOMESTEAD, PENNSYLVANIA




### Automation in practice

Automation in practice explains a new numerical control device for operating complex machine tools by means of digital instructions that are automatically computed and recorded on magnetic tape. Called "Digimatic," it consists of two principal units: a planning desk with a high-speed decimal computer

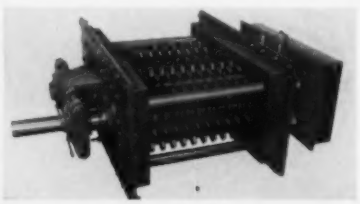


and tape recorder, and a machine control unit which governs the operation of a machine tool. In a demonstration the "Digamatic" produced a precision cam from a blank on a vertical milling machine. *Electronic Control Systems, Inc.*

For more data circle No. 56 on postcard, p. 181

### Double-roll grinder

This double-roll grinder for sizing solid materials is designed for heavy-duty loads and for installation in a sump, located either below or above floor level. Its double-roll construction offers sev-



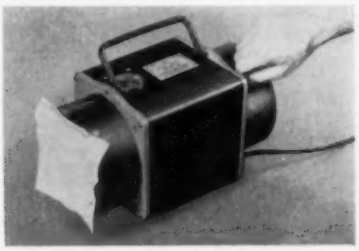
eral advantages over single roll types. First, by reason of its geometry, it can handle substantially larger pieces. Second, the desired maximum size of end product is maintained. Third, wear is less because sizing is accomplished by applying tremendous pressures at a few points of contact rather than by attrition. The grinder handles either wet or dry material with equal ease and can be operated with

its rolls submerged. Damage from water, grit or dust is eliminated by mounting the bearings outside the shaft stuffing boxes and by protecting them with lantern rings in the stuffing boxes. When dry materials are handled, compressed air is passed through the lanterns to prevent entrance of grit into the bearings and packing rings. With wet material, water is used for purging. *Allen-Sherman Hoff Co.*

For more data circle No. 57 on postcard, p. 181

## Air sampler

Enabling precise measurement of air-borne contaminants taken from large samples of air, this instrument is used to collect these contaminants to be weighed and analyzed in connection with industrial hygiene or air pollution problems. Feature of the instrument is an automatic flow control which compensates for changes of filter resistance caused by collected material. This is described as an important factor in achieving high accuracy in determining the volume of large samples of air. Automatic control of air flow rate is provided by a compensating damper in a by-pass duct for unfiltered air. Filtered air enters a plenum chamber and passes through a fixed orifice in a spring-loaded diaphragm plate. As filter resistance increases, pressure in the plenum chamber decreases, thus releasing the diaphragm plate to close a switch that starts the by-pass damper motor. The damper reduces the by-passed air flow, thereby increasing suction through the filter. Changes in supply voltage also cause damper operation to increase or decrease by-passed air flow and thus maintain constant air flow volume through the filter. *Mine Safety Appliances Co.*



For more data circle No. 58 on postcard, p. 181

A Conco engineered Crane is **top management's** idea of value. Quality like this means minimum maintenance cost, slow depreciation, tailored-to-the-job engineering, reduced accident hazards. Conco engineered Cranes reflect the more than 37 years experience that lies behind them. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.
FROM ANY VIEWPOINT
A FINER CRANE
CRANES HOISTS
CONCO

**CONCO ENGINEERING WORKS**

Division of H. D. Conkey & Company, 15 Grove Street, Mendota, Illinois

AFFILIATES: Conco Engineering Works—Domestic Heating Equipment • Conco Building Products Inc.,—Brick, Tile, Stone

JIB CRANES | ELECTRIC HOISTS | CHAIN HOISTS AND TROLLEYS | HAND GEARED CRANES | CRANE ASSEMBLIES

DIAMOND PERFORATED METALS

Need Holes in Metal Sheets?

Several considerations must usually be observed. The design should be attractive in appearance and the percentage of open area should be adequate while, at the same time, affording suitable concealment of what lies behind or underneath. Naturally, also, the right metal should be used in the right thickness.

Whenever Perforated Metal is required, and it has thousands of applications today, you'll do well to contact Diamond. Forty years of widely diversified experience and hundreds of modern tool arrangements enable us to give unsurpassed service and delivery. Catalog 39 (32 large pages) gives complete illustrated information. No charge or obligation.

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Box 41 WYOMING (Wilkes-Barre Area) PENNA.

METAL STAMPING FACILITIES

by Lansing

at your Service for...

TRANSPORTATION EQUIPMENT
HOUSEHOLD APPLIANCES
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INDUSTRIAL EQUIPMENT
FARM IMPLEMENTS

Lansing Stamping Co.
ESTABLISHED 1914
LANSING 2 MICHIGAN



## Contour checker

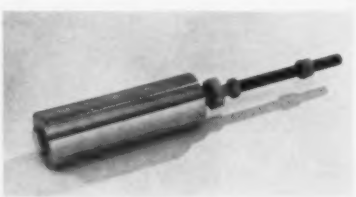
An instrument, known as the Contour-o-scope, checks dimensional radial accuracy of parts such as impellers, expellers, inducers, exducers, defusers, nozzles, turbine wheels, blades, two and three-dimensional cams and many other

parts having contoured surfaces. Outstanding features of this unit, which eliminates the need for intricate set-ups and layouts, are described as extreme accuracy, ease of operation and provision for direct readings. *Summit - Roberts Products, Inc.*

For more data circle No. 59 on postcard, p. 181

## Control cylinder

A hydraulic control cylinder of simple design and leak proof construction is being offered for the first time as an individual product. This unit has been used in all Rotafeed air-hydraulic drill units for years. When attached to any air cylinder, 0 in. to 4 in. of rapid approach is available with infinitely



variable feed in one direction and rapid return in the other direction. (Max. checking capacity is 3000 lb.) Longer strokes and larger capacities are available on order. The basic unit has a micro-honed 2 in. bore and 4 in. hydraulic feed. *Rotafeed Co.*

For more data circle No. 60 on postcard, p. 181

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

STAMPINGS for the FINISHED PRODUCT

SEE SESSIONS . . . for Metal Specialties, Box & Case Hardware, Stamped Assemblies in a wide range of finishes.

J. H. SESSIONS & SON

290 RIVERSIDE AVENUE • BRISTOL, CONN.



COMBINED FOR

## Vacuum cleaner

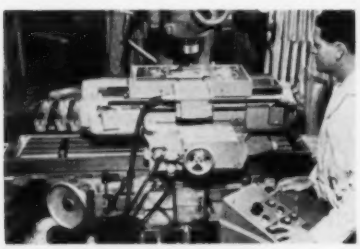
Hard pick-up jobs can now be done faster and easier with the extremely high suction power for wet or dry pick-ups of a new heavy duty vacuum. It is reported as featuring: a powerful motor unit and new type fans which combine to produce suction; a filter bag which can be cleaned while machine is

running or before tank is emptied; and automatic water shut-off which cuts off suction when liquid reaches proper height. The vacuum is furnished in three motor sizes—1½ hp, 2 hp, or 3 hp, depending on power needs. *American Cleaning Equipment Corp.*

For more data circle No. 61 on postcard, p. 181

## Indexing table

Fully electric and pushbutton controlled, the Micro-Positioner is an automatic indexing table for use in combination with radial drills, milling machines, turret drills or other suitable spindles. Easily portable, it weighs only 1000 lb.



Setup is simple, according to the manufacturer. An accumulator mechanism can be used or a master part can be mounted on the table. *Micro-Positioner Corp.*

For more data circle No. 62 on postcard, p. 181

KEYED TO PRODUCTION!

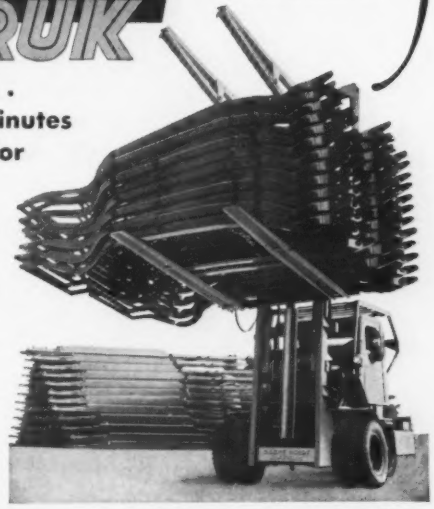
SILENT HOIST LIFTRUK

3-5-6-7½-8
10-12-15
Ton Capacities
FLUID DRIVE
POWER STEERING

"72 frames per load . . . three lifts every four minutes . . . proves our needs for additional LIFTRUKS"

The SILENT HOIST Heavy-Duty Fork LIFTRUK so rapidly stepped up the production and movement of material, over past handling methods, that this Plant Manager (quoted above), was equally quick to anticipate *fleet* LIFTRUK operations in their plant. *Another example that LIFTRUK pays its way!*

Can we aid in solving your problems?
*Send for Bulletin #77.*

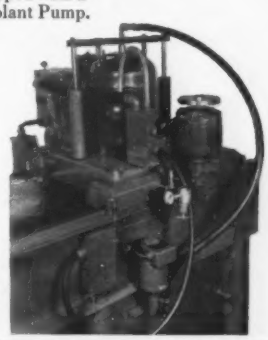


SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.

for balanced performance specify RUTHMAN GUSHER COOLANT PUMPS

Here are the reasons why so many of the leading machine tool builders insist on "Gusher" Coolant Pumps for their machines.

Illustrated is a Model 545 Lempco Automatic Wet Surface Grinder equipped with a "Gusher" Coolant Pump.



MODEL 11022

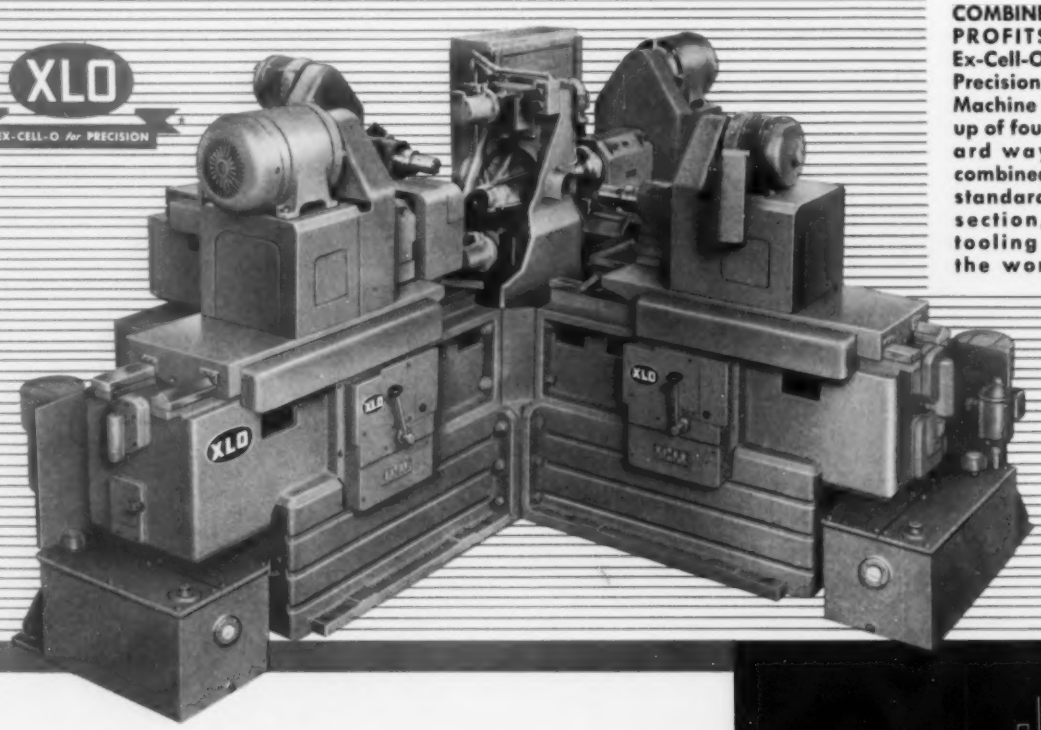
BETTER PERFORMANCE — No priming is necessary — Gusher pumps deliver split-second flow from a trickle to full volume.

LESS MAINTENANCE—Heavy duty pre-lubricated ball-bearings and the absence of packing, foot or relief valves reduces the need of attention to a minimum.

LONGER LIFE — The rotating assembly of all "Gusher" Pumps is dynamically balanced . . . to reduce vibration and wear. There is no metal-to-metal contact within the pump housing. Gusher Pumps are precision built for a long trouble-free life.

THE RUTHMAN MACHINERY CO.
1809-1823 READING RD. CINCINNATI 2, OHIO

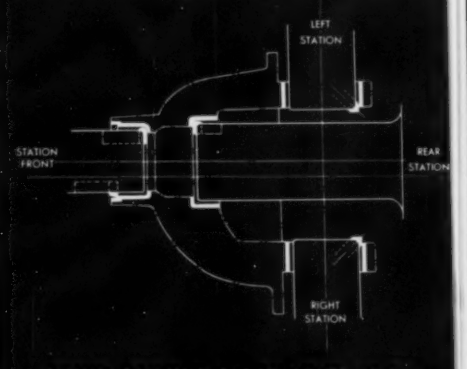
XLO
EX-CELL-O for PRECISION




**COMBINED FOR PROFITS**—this Ex-Cell-O 4-Way Precision Boring Machine is made up of four standard way units combined with a standard center section, with tooling to suit the work.

## 4 HOLES, 90° APART, BORED SIMULTANEOUSLY

# BY EX-CELL-O 4-WAY MACHINE




SIMULTANEOUS MACHINING of four holes assures a 90° relationship between bearing bores and pinion bores.

This differential carrier assembly requires the boring of accurate holes at right angles to one another. Bore diameters are held as close as .0005". Shoulders must be square with bores. Bearing bores must be square with pinion bores.

Here was an opportunity to combine operations by using an Ex-Cell-O 4-Way Precision Boring Machine, with these profitable results:

**FASTER PRODUCTION**—machine works simultaneously from four directions.

**PRECISION**—accurate bores, holding the 90° relationship, are produced by precision spindles, smooth, hydraulically operated slides, and accurate location of the way units.

**RELOCATION ERRORS ELIMINATED**—since the part is located and clamped only once, there can be no errors caused by relocating and reclamping.

Is there an opportunity to cut costs and combine operations in your product? These way-type precision boring machines, special machines composed of standard units, also are used in automated production lines. They can be placed side by side and connected with transfer type fixtures to form transfer machines, or they can be combined in a transfer machine at those stations where precision boring and similar operations are required.

Ask your Ex-Cell-O Representative about all the other advantages of Ex-Cell-O Way Machines, or write for Bulletin.

## EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

56-3

# The Iron Age SUMMARY . . .

**Detroit lethargy may boomerang if auto sales perk up . . . Steel labor could upset the applecart . . . Third quarter letdown seen . . . Non-automotive consumers strong.**

**Detroit Gamble** . . . Auto companies are gambling that steel producers will love them in July and August as they do in May. But it's a gamble that could leave Detroit out on a limb should new car sales show a summer upturn.

Auto firms have been shying away from July and August steel commitments, figuring they can live largely off inventories until new models go into production. And some of this tonnage is being snapped up by other consumers. Mills are warning Detroit it will be tough to get back on order books in an emergency.

As things stand now, the third quarter is shaping up as a period of letdown in steel. It will be a breather for the mills, who plan to use it for urgently needed maintenance work.

**Labor Outlook** . . . All bets will be off if steel labor negotiations run into a snag. And the betting this week is 55-45 against a peaceful settlement. Labor's asking price is outlandishly high and will have to be cut drastically before steel companies will go along. It will be touch-and-go down to the wire. The sensitive point between a strike or no strike will range between 17 and 20¢ an hour.

Steel inventories in consumers' hands are hard to put the finger on. It's a safe bet that cold-rolled sheet and strip stocks are fairly ample. But inventories of other steel shapes are at the least out of balance. And it would not be long before some consumers would be running short if steel supply is cut off. It's estimated that a two-week strike would hit hard at more than 50 pct of steel users.

The letdown in cold-rolled sheet consumption is a break for consumers of hot-rolled sheets and light plate. Mills that several months ago were turning down hot-rolled sheet orders are out soliciting business now.

**Scrap Rhubarb** . . . Apart from automotive, steel-using industries are rolling along at a strong pace. There has been no letup in oil and gas demand, and the so-called letdown in appliances is hardly worth mentioning at the mill level. Construction is in the midst of another boom. And an IRON AGE study shows that freight car builders will need something like three million ingot tons to make a dent in order backlogs.

Scrap prices continued to head downward, but the battle over exports seems to be gathering a head of steam in Washington. Administration sentiment still favors relatively free exporting.

## Steel Output, Operating Rates

| Production | This Week | Last Week | Month Ago | Year Ago |
|---|---|---|---|---|
| (Net tons, 000 omitted) | 2,388 | 2,363 | 2,462 | 2,340 |
| **Ingot Index** | | | | |
| (1947-1949=100) | 148.7 | 147.1 | 153.3 | 145.5 |
| **Operating Rates** | | | | |
| Chicago | 100.0 | 100.0* | 99.0 | 98.0 |
| Pittsburgh | 99.0 | 99.0* | 106.0 | 99.0 |
| Philadelphia | 100.0 | 101.0* | 105.0 | 97.0 |
| Valley | 99.0 | 98.0* | 93.0 | 98.0 |
| West | 100.0 | 97.5* | 105.0 | 100.0 |
| Detroit | 97.0 | 100.0* | 100.0 | 94.0 |
| Buffalo | 105.0 | 105.0 | 105.0 | 105.0 |
| Cleveland | 106.5 | 101.0* | 106.0 | 101.0 |
| Birmingham | 23.5 | 23.5 | 96.0 | 93.5 |
| S. Ohio River | 94.0 | 94.0 | 97.0 | 89.0 |
| Wheeling | 104.0 | 102.0* | 96.0 | 101.0 |
| St. Louis | 99.0 | 94.0 | 97.0 | 106.0 |
| Northeast | 93.0 | 87.0* | 94.0 | 89.0 |
| **Aggregate** | 97.0 | 96.0 | 100.0 | 97.0 |

*Revised

## Prices At A Glance

(cents per lb unless otherwise noted)

| | This Week | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| **Composite price** | | | | |
| Finished Steel, base | 5.179 | 5.179 | 5.179 | 4.797 |
| Pig Iron (Gross Ton) | $60.29 | $60.29 | $60.29 | $56.59 |
| Scrap, No. 1 hvy (gross ton) | $49.67 | $50.33 | $55.50 | $34.00 |
| **Nonferrous** | | | | |
| Aluminum ingot | 25.90 | 25.90 | 25.90 | 23.20 |
| Copper, electrolytic | 46.00 | 46.00 | 46.00 | 36.00 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 14.80 |
| Magnesium | 34.50 | 34.50 | 34.50 | 29.25 |
| Nickel, electrolytic | 64.50 | 64.50 | 64.50 | 67.67 |
| Tin, Straits, N. Y. | 96.875 | 97.125 | 99.50 | 91.50 |
| Zinc, E. St. Louis | 13.50 | 13.50 | 13.50 | 12.00 |

# Price Hike Spreads South, West

**Scarce grades affected by new announcements . . . Easing cold rolled market may bring respite to hot rolled and light plate users . . . Construction, oil industries biggest buyers.**

◆ THE UPWARD PRICE trend continues. Youngstown Sheet and Tube Co., following the lead of U. S. Steel Corp., increased certain extras, including those for alloy grades applicable to hot rolled bars, hot rolled sheet and strip, plates, semi-finished and for oil country continuous weld carbon steel tubing and casing. Wyckoff Steel boosted cold finished bar extras to offset rise in hot rolled extras.

The new Youngstown price of C. W. tubing and casting are, per 100 ft. f.o.b. mill: 2⅜ in. o.d. 4.60# non-upset tubing, $44.90; 2⅜ in. o.d. 4.70# external upset tubing $48.29; 2⅞ in. o.d. 6.40# non-upset tubing $58.99; 2⅞ in. o.d. $6.50# external upset tubing $63.49; 4½ in. o.d. 6.50# c.w. casing $82.56.

Atlantic Steel Co. says increased costs have made it necessary to advance prices on hot rolled bars and strip and other merchant and special quality grades. Equalization of competitive delivered prices (freight and base) was discontinued.

Revised per cwt prices, f.o.b. Atlanta, Ga., are: hot rolled carbon steel bars, merchant quality, $5.15; hot rolled carbon steel bars, special quality, $5.50; hot rolled strip, $4.525; new billet deformed reinforcing bar, $5.15; bar size channels, merchant quality, $5.70; bar size channels, special quality, $6.05; bar size tees, merchant quality, $6.20; bar size tees, special quality $6.55.

The Atlantic Steel increases will up the final prices of hot rolled carbon steel bars, both merchant and special quality, and new billet deformed reinforcing bars, by $6 per ton.

With the demand for cold rolled sheet and strip easing, plate consumers were getting a break in that some producers are using their sheet mills for turning out light plate. Consumers of hot rolled sheet and strip also found that mills were more willing to sell hot rolled products now that cold rolled demand is dropping.

SHEET AND STRIP . . . A **Pittsburgh** producer reports continued deferments on automotive orders for flat rolled. Normal decline was due to model changeover; is accentuated by need to adjust carmaking schedules for liquidation of finished inventories, now reported to be 900,000 units. Same mill reports increasing orders from all offices not dependent on automotive, say things will be as tight as ever once **Detroit** snaps back. In **Chicago**, inactivity in auto demand for cold rolled now spreading to include slowing of hot rolled sheet demand among components fabricators, with result that mills are wiping out hot rolled sheet carryovers and plate buyers are hoping they'll get some relief. Cold rolled sheet is back on current orders. The **Detroit** sheet market is slow and the strip situation is even slower. Due, of course, to automotive inactivity. One **Cleveland** area mill for the first time this year is putting out lists of steel products available from mill inventories. These consist of small quantities of cold rolled sheets, prime and secondary, in 5000 to 10,000 lb lots. Most of the accumulation is from canceled tonnages. A strong issue is being made of cancellations by one mill, especially if order is called off while steel is in production. Appliance firms continue to order regularly, but auto producers have up to 35 days' inventory on hand, and additional cutbacks in steel ordering appear on the way.

BARS . . . Backlogs in cold finished are melting pretty fast in **Chicago**, but hot rolled is an item not in generous supply. Inventories of this grade still runnng below normal. Rerolling bar stock available on 60 days' delivery. **West Coast** mills are booked well into the third quarter and there is definitely no inventory buildup by customers. Mills say increasing demand is to cover backlog and current work on hand. In **Detroit** July orders are now on the books.

PLATE AND STRUCTURALS . . . In **Chicago** plate again seems to be tightening as buyers report they find mill carryovers extending slightly. This is mainly in plate of ½ in. and up in thickness, but light plate certainly is not easy and is really bad in the wide sizes. Carryovers average 4-5 weeks, with some now extending longer. Carryovers in structurals in **Chicago** are about the same as plate, though mills are doing a better delivery job in the smaller sizes. General demand for structurals is high and jobs still being held back for lack of material, including even those spots where only small tonnages are used. **Detroit** producers report that plate and structural are the only two bright spots in the picture. Demand for both is tremendous and nobody knows when it will let up. The **West Coast** market remains tight as the construction boom continues.

WAREHOUSES . . . General business volume in **Chicago** seems to be off, but there is still a lot of dissatisfaction with inventories. Warehouses are out of plate, though loading up on sheet. Light shape picture seems to be improving inventory-wise, if only slightly. East and **Cleveland** offerings of plate, apparently from brokers, in fairly large lots but in most cases prices have been pretty stiff for local consumption. **West Coast** warehousemen say there's a lot of talk about customers' inventory buildups. But it's more talk than fact, they add. While customers would like to buy ahead to hedge against a possible strike and price hike, there simply isn't that much steel around.

**Purchasing Agent's Checklist**

LABOR: Steelworkers will have to pare demands ..... p. 101

FUEL: Tank building boom hits plate supply ..... p. 106

STEEL: Will third quarter bring letdown? ..... p. 215

# Comparison of Prices

*(Effective May 22, 1956)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | May 22 1956 | May 15 1956 | Apr. 24 1956 | May 24 1955 |
|---|---|---|---|---|
| **Flat-Rolled Steel:** (per pound) | | | | |
| Hot-rolled sheets | 4.325¢ | 4.325¢ | 4.325¢ | 4.05¢ |
| Cold-rolled sheets | 5.325 | 5.325 | 5.325 | 4.95 |
| Galvanized sheets (10 ga.) | 5.85 | 5.85 | 5.85 | 5.45 |
| Hot-rolled strip | 4.325 | 4.325 | 4.325 | 4.05 |
| Cold-rolled strip | 6.28 | 6.28 | 6.28 | 5.79 |
| Plate | 4.52 | 4.52 | 4.52 | 4.225 |
| Plates, wrought iron | 10.40 | 10.40 | 10.40 | 9.30 |
| Stainl's C-R strip (No. 302) | 44.50 | 44.50 | 44.50 | 41.50 |
| **Tin and Terneplate:** (per base box) | | | | |
| Tinplate (1.50 lb.) cokes | $9.85 | $9.45* | $9.45* | $9.05 |
| Tinplate, electro (0.50 lb.) | 8.55 | 8.15* | 8.15* | 7.75 |
| Special coated mfg. ternes | 9.10 | 8.70* | 8.70* | 7.85 |
| **Bars and Shapes:** (per pound) | | | | |
| Merchant bars | 4.65¢ | 4.65¢ | 4.65¢ | 4.30¢ |
| Cold finished bars | 5.90 | 5.90 | 5.90 | 5.40 |
| Alloy bars | 5.65 | 5.65 | 5.65 | 5.075 |
| Structural shapes | 4.60 | 4.60 | 4.60 | 4.25 |
| Stainless bars (No. 302) | 38.25 | 38.25 | 38.25 | 35.50 |
| Wrought iron bars | 11.50 | 11.50 | 11.50 | 10.40 |
| **Wire:** (per pound) | | | | |
| Bright wire | 6.60¢ | 6.60¢ | 6.60¢ | 5.75¢ |
| **Rails:** (per 100 lb.) | | | | |
| Heavy rails | $4.725 | $4.725 | $4.725 | $4.45 |
| Light rails | 5.65 | 5.65 | 5.65 | 5.35 |
| **Semifinish Steel:** (per net ton) | | | | |
| Rerolling billets | $68.50 | $68.50 | $68.50 | $64.00 |
| Slabs, rerolling | 68.50 | 68.50 | 68.50 | 64.00 |
| Forging billets | 84.50 | 84.50 | 84.50 | 78.00 |
| Alloy blooms, billets, slabs | 96.00 | 96.00 | 96.00 | 86.00 |
| **Wire Rod and Skelp:** (per pound) | | | | |
| Wire rods | 5.025¢ | 5.025¢ | 5.025¢ | 4.675¢ |
| Skelp | 4.225 | 4.225 | 4.225 | 3.90 |
| **Finished Steel Composite:** (per pound) | | | | |
| Base price | 5.179¢ | 5.179¢ | 5.179¢ | 4.797¢ |

| | May 22 1956 | May 15 1956 | Apr. 24 1956 | May 24 1955 |
|---|---|---|---|---|
| **Pig Iron:** (per gross ton) | | | | |
| Foundry del'd Phila. | $65.26 | $65.26 | $65.26 | $61.19 |
| Foundry Valley | 60.50 | 60.50 | 60.50 | 56.50 |
| Foundry, Southern Cin'ti | 62.93 | 62.93 | 62.93 | 60.43 |
| Foundry, Birmingham | 55.00 | 55.00 | 55.00 | 52.88 |
| Foundry, Chicago | 60.50 | 60.50 | 60.50 | 56.50 |
| Basic del'd Philadelphia | 64.48 | 64.48 | 64.48 | 60.27 |
| Basic, Valley furnace | 60.00 | 60.00 | 60.00 | 56.00 |
| Malleable, Chicago | 60.50 | 60.50 | 60.50 | 56.50 |
| Malleable, Valley | 60.50 | 60.50 | 60.50 | 56.50 |
| Ferromanganese‡, cents per lb. | 9.50¢ | 9.50¢ | 9.50¢ | 9.50¢ |
| ‡ 74.76 pct Mn base. | | | | |
| **Pig Iron Composite:** (per gross ton) | | | | |
| Pig iron | $60.29 | $60.29 | $60.29 | $56.59 |
| **Scrap:** (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | $48.50 | $48.50 | $56.50 | $34.50 |
| No. 1 steel, Phila. area | *51.50* | 53.50 | 55.50 | 35.00 |
| No. 1 steel, Chicago | 49.00 | 48.50 | 54.50 | 32.50 |
| No. 1 bundles, Detroit | 46.50 | 46.50 | 53.50 | 27.00 |
| Low phos., Youngstown | *54.50* | 56.50 | 62.50 | 35.50 |
| No. 1 mach'y cast, Pittsburgh | 56.50 | 56.50 | 58.50 | 43.50 |
| No. 1 mach'y cast, Philadel'a | 55.50 | 55.50 | 55.50 | 44.50 |
| No. 1 mach'y cast, Chicago | *51.50* | 52.50 | 57.50 | 45.50 |
| **Steel Scrap Composite:** (per gross ton) | | | | |
| No. 1 heavy melting scrap | *$49.67* | $50.33 | $55.50 | $34.00 |
| **Coke, Connellsville:** (per net ton at oven) | | | | |
| Furnace coke, prompt | $14.50 | $14.50 | $14.25 | $13.25 |
| Foundry coke, prompt | 17.50 | 17.50 | 17.50 | 16.25 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | $46.00 | $46.00 | $46.00 | $36.00 |
| Copper, Lake, Conn. | 46.00 | 46.00 | 46.00 | 36.00 |
| Tin, Straits, New York | *96.875*† | 97.125 | 98.75 | 91.375 |
| Zinc, East St. Louis | 18.50 | 18.50 | 13.50 | 12.00 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 14.80 |
| Aluminum, virgin ingot | 25.90 | 25.90 | 25.90 | 23.20 |
| Nickel, electrolytic | 64.50 | 64.50 | 64.50 | 67.67 |
| Magnesium, ingot | 34.50 | 34.50 | 34.50 | 29.25 |
| Antimony, Laredo, Tex. | 33.00 | 33.00 | 33.00 | 28.50 |

† Tentative. ‡ Average. *Revised.

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

**Steel Scrap Composite**

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 228→

| Producing Point | Basic | Fdry | Mall. | Bess. | Low Phos. |
|---|---|---|---|---|---|
| Bethlehem *B3* | 62.00 | 62.50 | 63.00 | 63.50 | ..... |
| Birdsboro, Pa. *B6* | 62.00 | 62.50 | 63.00 | 63.50 | ..... |
| Birmingham *R3* | 54.50 | 55.00* | ..... | ..... | ..... |
| Birmingham *W9* | 54.50 | 55.00* | 59.00 | ..... | ..... |
| Birmingham *U4* | 54.50 | 55.00* | 59.00 | ..... | ..... |
| Buffalo *R3* | 60.00 | 60.50 | 61.00 | 61.50 | ..... |
| Buffalo *H1* | 60.00 | 60.50 | 61.00 | ..... | ..... |
| Buffalo *W6* | 60.00 | 60.50 | 61.00 | 61.50 | ..... |
| Chester *C17* | 62.00 | 62.50 | 63.00 | ..... | ..... |
| Chicago *I4* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| Cleveland *A5* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00† |
| Cleveland *R3* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| Duluth *I4* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00 |
| Erie *I4* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00 |
| Everett *M6* | ..... | ..... | 62.50 | 63.00 | ..... |
| Fontana *K1* | 67.50 | 68.00 | ..... | ..... | ..... |
| Geneva, Utah *C7* | 60.00 | 60.50 | ..... | ..... | ..... |
| Granite City *G2* | 61.90 | 62.40 | 62.90 | ..... | ..... |
| Hubbard *Y1* | ..... | ..... | 60.50 | ..... | ..... |
| Lone Star *L3* | ..... | 55.00 | ..... | ..... | ..... |
| Midland *C11* | 60.00 | ..... | ..... | ..... | ..... |
| Minnequa *C6* | 62.00 | 62.50 | 63.00 | ..... | ..... |
| Monessen *P6* | 60.00 | ..... | ..... | ..... | ..... |
| Neville Is. *P4* | 60.00 | 60.50 | 60.50 | 61.00 | 65.00† |
| N. Tonawanda *T1* | ..... | 60.50 | 61.00 | 61.50 | ..... |
| Pittsburgh *U1* | 60.00 | ..... | 60.50 | 61.00 | ..... |
| Sharpsville *S3* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| So. Chicago *R3* | 60.00 | ..... | 60.50 | ..... | ..... |
| Steelton *B3* | 62.00 | 62.50 | 63.00 | 63.50 | 68.00 |
| Swedeland *A2* | 62.00 | 62.50 | 63.00 | 63.50 | ..... |
| Toledo *I4* | 60.00 | 60.50 | 60.50 | 61.00 | ..... |
| Troy, N. Y. *R3* | 62.00 | 62.50 | 63.00 | 63.50 | 68.00 |
| Youngstown *Y1* | ..... | ..... | 60.50 | 61.00 | ..... |

**DIFFERENTIALS:** Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos.† Intermediate low phos.

Silvery Iron Buffalo, *H1*, $68.75; Jackson, *J1, G1*, $67.50. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

| Product | 201 | 202 | 301 | 302 | 303 | 304 | 316 | 321 | 348 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, reroll. | 18.50 | 19.75 | 19.25 | 20.50 | — | 21.75 | 31.50 | 25.00 | 33.75 | 15.00 | — | 15.25 |
| Slabs, billets, reroll. | 23.00 | 25.50 | 23.75 | 26.75 | 26.75 | 27.50 | 40.25 | 32.00 | 43.00 | 19.50 | — | 19.75 |
| Forg. dcs., die blks., rgs. | — | — | — | — | — | — | — | — | — | — | — | — |
| Billets, forging | — | 31.00 | 31.75 | 32.00 | 34.75 | 33.75 | 51.25 | 38.25 | 51.00 | 25.50 | 26.00 | 26.00 |
| Bars, struct. | — | 36.75 | 38.00 | 38.25 | 41.00 | 40.25 | 60.75 | 45.25 | 60.00 | 30.50 | 31.00 | 31.00 |
| Plates | — | 38.75 | 40.00 | 40.25 | 42.75 | 43.00 | 64.00 | 49.25 | 64.75 | 31.75 | 32.25 | 32.25 |
| Sheets | 42.25 | 42.50 | 44.25 | 44.50 | 52.25 | 47.25 | 68.25 | 54.25 | 73.50 | 36.25 | — | 36.75 |
| Strip, hot-rolled | 31.00 | 33.50 | 32.00 | 34.50 | — | 37.25 | 58.25 | 44.25 | 50.75 | — | — | — |
| Strip, cold-rolled | 39.00 | 42.50 | 41.00 | 44.50 | — | 47.25 | 68.25 | 54.25 | 73.50 | 36.25 | — | 36.75 |
| Wire CF, HR; Rod HR | — | — | 36.00 | 36.25 | 39.00 | 38.25 | 57.75 | 43.00 | 57.00 | 29.00 | 29.50 | 29.50 |

STAINLESS STEEL PRODUCING POINTS:

*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2,* (2.25¢ lower on Type 430) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Philadelphia, *D5.*

*Strip:* Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3,* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6.*

*Bar:* Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5;* Ft. Wayne, *I4;* Philadelphia, *D5;* Detroit, *R5.*

*Wire:* Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

*Structurals:* Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

*Plates:* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Philadelphia, *D5.*

*Forged discs, die blocks, rings:* Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

*Forgings billets:* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5.*

# Uncertain Market Wavers

**Erratic price declines show in most market areas . . . Composite slumps below $50 . . . Uncertainty on steel labor contributes to uneasiness of market.**

◆ GENERAL UNCERTAINTY in the scrap market resulted in erratic price declines in most market areas.

No definite pattern of lower prices was established, with steelmaking grades holding more or less firm in Chicago and Pittsburgh but slumping elsewhere.

A $2 drop in Philadelphia, caused by inactivity and offers to sell at specific prices, sent THE IRON AGE composite price down to $49.67. But even where prices held to quoted levels, there were general predictions of more drops to come in the next few weeks.

Price declines at this time do not indicate a real weakness in the market. They are caused by (1) mill refusal to pay higher prices, (2) fear of a possible steel strike next month, and (3) a general shakedown from inflated levels to a more realistic price structure.

In most markets, railroad grades, turnings, and some cast and foundry grades continued to slump.

Scrap prices may become a national issue, with steel executives, the Business and Defense Services Administration, and representatives of the scrap industry all involved in the scrap export picture.

Ben Moreell of Jones & Laughlin and E. T. Weir of National Steel have asked Congress to take action against scrap exports. (See P. 109 for complete story on scrap control demands.)

**Pittsburgh** . . . There have been no new mill orders for openhearth scrap in Pittsburgh. The mills are holding off buying. One broker said his low phos customers are out of the market for May. Consumers feel they can buy for less if they wait. In a last-minute action, a district consumer bought No. 2 bundles for $38. On the other hand, dealer shipments are slowing down. One source said the market had been oversold, that brokers could not make delivery and the mills were going to cancel orders. Despite this spot shortage, the mills feel they can drop prices another $4 without cutting off their supply.

**Chicago** . . . In a relatively slow market, prices did not show great change though several refusals of additional tonnages by buyers in this area may affect the market in the near future. Meantime, fairly large tonnages of material continue to move on previous orders and scrap is not accumulating in yards in any great quantity. Electric furnace showed some strengthening, and cast volume is holding well.

**Philadelphia** . . . For the second consecutive week, there has been little activity in steelmaking grades. Dealers indicate that they would be willing to sell No. 1 heavy melting at $52.00, off $2 from previous week. Mills appear to have comfortable inventories, are waiting for a major consumer to come into the market to establish price levels.

**New York** . . . Continued absence of orders from steel mills has lowered prices of steelmaking grades about $2 per ton here. Brokers expect consumer disinterest to last until settlement of labor conditions, then see stepped-up buying.

**Detroit** . . . A buy outside the area boosted price of blast furnace grades $2 per ton. Overall tone of the market remains soft. Local activity at a standstill in anticipation of automotive lists, which begin closing this week. New busheling, listed at $50 last week should have been $47.

**Cleveland** . . . Market settled $1 lower at $51 top for No. 1 heavy melting when a local mill which held up shipments the previous week placed a new order for modest tonnage. The Valley dropped $2 with a purchase there at $54 for only activity anywhere. Shipments still continue on old orders, but dealer inventories are low and collections slow. Both mills and dealers are resigned to watchful waiting pending steel operations and labor outlook, with only minor purchases expected. Foundry market and blast furnace also continued about $1 lower. Railroad cast in Cleveland last week should have been quoted at $56-57.

**Birmingham** . . . A last-minute purchase by a leading consumer dropped prices of top melting grades $3 per ton this week. Activity was a further reflection of weakening conditions in this area. The purchase was in quantity and followed a period of consumer lethargy and apparent waiting for the opportune moment.

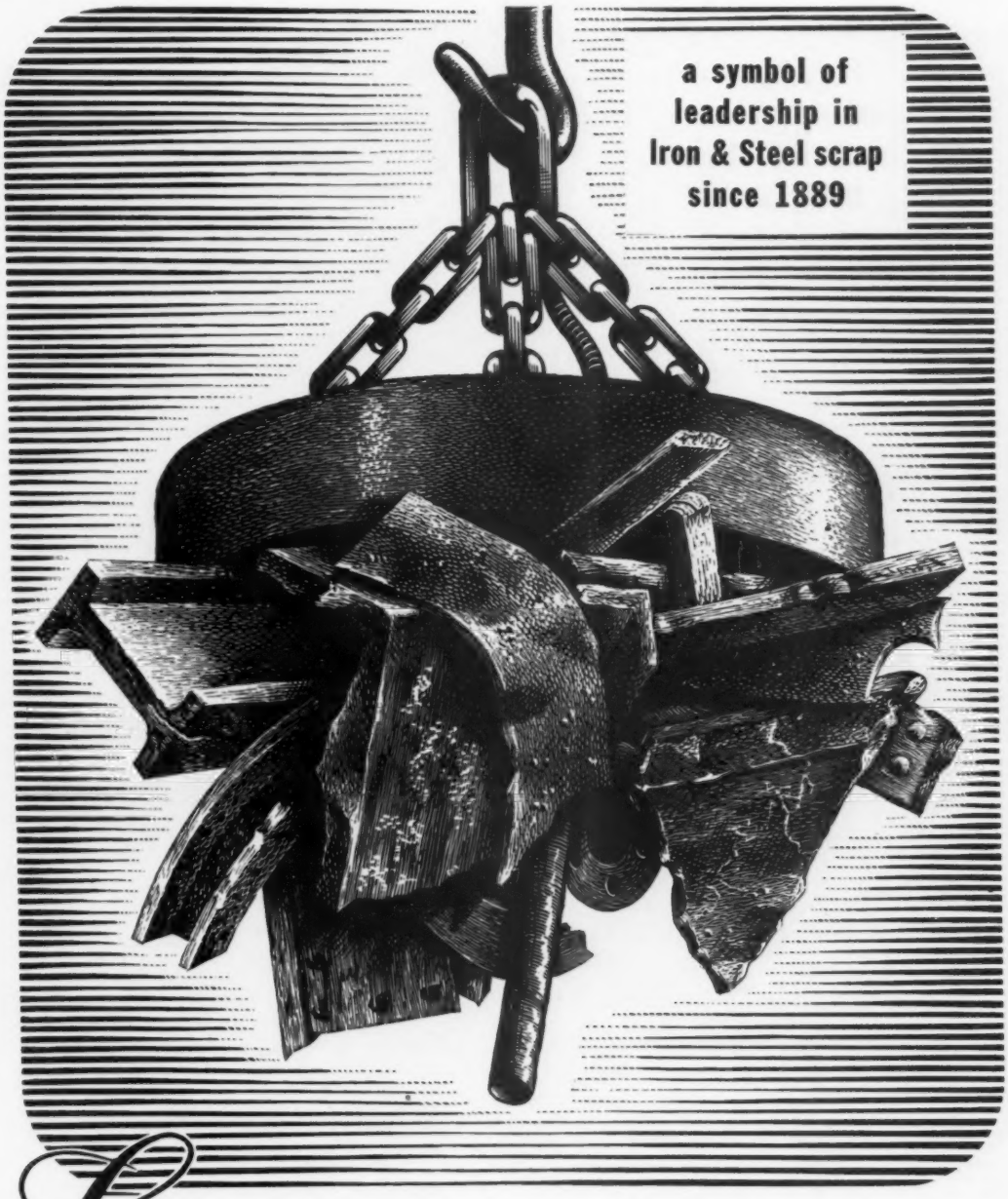
**St. Louis** . . . Mopac list of 208 carloads of scrap, including 100 carloads of No. 1 RR heavy melting, brought sharply lower prices, as much as $5.50, on most items. The only advance was $1 for axles based on a mill sale. Borings and turnings were down $1. Cast iron grades are in light demand. Steel operating rate was up nearly 6 points to 99 pct.

**Cincinnati** . . . Shipments on old orders continue at high levels, but new activity was nil following last week's small order. Turnings and some cast grades were down $1 due to cautious buying by foundries waiting until prices hit bottom. Foundry business still relatively slow.

**Buffalo** . . . The market remains slow with no major purchases. Dealers fear mills will try to lower prices when they do purchase. Scrap is moving into the area's biggest mill at a high rate from local sources and by boat from other Lake ports.

**Boston** . . . Prices dropped again this week as consumers remained out of the market and exports continued at a snail's pace. Top melting grades dropped $4 per ton, as did electric furnace scrap.

**West Coast** . . . Prices firmed up in Los Angeles and San Francisco. Mills are getting what they need at the new price level. Export activity keeps buyers on the alert.




*Luria Brothers and Company, Inc.*

MAIN OFFICE
**PHILADELPHIA NATIONAL BANK BLDG.**
Philadelphia 7, Penna.

PLANTS
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MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES
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CHICAGO, ILLINOIS LOS ANGELES, CAL. SAN FRANCISCO, CAL.
CLEVELAND, OHIO NEW YORK, N. Y. SEATTLE, WASH.
PITTSBURGH, PA.
*in Canada* MONTREAL, QUEBEC — HAMILTON, ONTARIO

**EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

# Scrap Prices *(Effective May 22, 1956)*

## Iron and Steel Scrap

**Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.**

### Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $48.00 to $49.00 |
| No. 2 hvy. melting | 42.00 to 43.00 |
| No. 1 bundles | 48.00 to 49.00 |
| No. 2 bundles | 37.00 to 38.00 |
| Machine shop turn. | 34.00 to 35.00 |
| Mixed bor. and ms. turn. | 34.00 to 35.00 |
| Shoveling turnings | 38.00 to 39.00 |
| Cast iron borings | 38.00 to 39.00 |
| Low phos. punch'gs plate | 58.00 to 59.00 |
| Heavy turnings | 48.00 to 49.00 |
| No. 1 RR. hvy. melting | 60.00 to 61.00 |
| Scrap rails, random lgth. | 66.00 to 67.00 |
| Rails 2 ft and under | 70.00 to 71.00 |
| RR. steel wheels | 64.00 to 65.00 |
| RR. spring steel | 64.00 to 65.00 |
| RR. couplers and knuckles | 64.00 to 65.00 |
| No. 1 machinery cast | 56.00 to 57.00 |
| Cupola cast | 50.00 to 51.00 |
| Heavy breakable cast | 48.00 to 49.00 |

### Chicago

| | |
|---|---|
| No. 1 hvy. melting | $48.00 to $50.00 |
| No. 2 hvy. melting | 38.00 to 40.00 |
| No. 1 factory bundles | 53.00 to 54.00 |
| No. 1 dealers' bundles | 49.00 to 50.00 |
| No. 2 dealers' bundles | 35.00 to 36.00 |
| Machine shop turn. | 26.00 to 27.00 |
| Mixed bor. and turn. | 28.00 to 29.00 |
| Shoveling turnings | 28.00 to 29.00 |
| Cast iron borings | 28.00 to 29.00 |
| Low phos. forge crops | 59.00 to 60.00 |
| Low phos. punch'gs plate | 55.00 to 56.00 |
| Low phos. 3 ft and under | 54.00 to 55.00 |
| No. 1 RR. hvy. melting | 55.00 to 56.00 |
| Scrap rails, random lgth. | 64.00 to 65.00 |
| Rerolling rails | 71.00 to 72.00 |
| Rails 2 ft and under | 70.00 to 71.00 |
| Locomotive tires, cut | 59.00 to 60.00 |
| Cut bolsters & side frames | 58.00 to 60.00 |
| Angles and splice bars | 65.00 to 66.00 |
| RR. steel car axles | 70.00 to 71.00 |
| RR. couplers and knuckles | 58.00 to 59.00 |
| No. 1 machine cast | 51.00 to 52.00 |
| Cupola cast | 47.00 to 48.00 |
| Heavy breakable cast | 41.00 to 42.00 |
| Cast iron brake shoe | 40.00 to 41.00 |
| Cast iron wheel | 52.00 to 53.00 |
| Malleable | 61.00 to 62.00 |
| Stove plate | 41.00 to 42.00 |
| Steel car wheels | 57.00 to 58.00 |

### Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $51.00 to $52.00 |
| No. 2 hvy. melting | 43.00 to 44.00 |
| No. 1 bundles | 51.00 to 52.00 |
| No. 2 bundles | 40.00 to 41.00 |
| Machine shop turn. | 34.00 to 35.00 |
| Mixed bor. short turn. | 36.00 to 37.00 |
| Cast iron borings | 39.00 to 40.00 |
| Shoveling turnings | 38.00 to 39.00 |
| Clean cast chem. borings | 44.00 to 45.00 |
| Low phos. 5 ft and under | 55.00 to 56.00 |
| Low phos. 2 ft and under | 56.00 to 57.00 |
| Low phos. punch'gs | 56.00 to 57.00 |
| Elec. furnace bundles | 54.00 to 55.00 |
| Heavy turnings | 47.00 to 48.00 |
| RR. steel wheels | 60.00 to 61.00 |
| RR. spring steel | 60.00 to 61.00 |
| Rails 18-in. and under | 65.00 to 66.00 |
| Cupola cast | 49.00 to 50.00 |
| Heavy breakable cast | 53.00 to 54.00 |
| Cast iron car wheels | 58.00 to 59.00 |
| Malleable | 69.00 to 70.00 |
| Unstripped motor blocks | 38.00 to 39.00 |
| No. 1 machinery cast | 55.00 to 56.00 |

### Cleveland

| | |
|---|---|
| No. 1 hvy. melting | $50.00 to $51.00 |
| No. 2 hvy. melting | 39.00 to 40.00 |
| No. 1 bundles | 50.00 to 51.00 |
| No. 2 bundles | 35.00 to 36.00 |
| No. 1 busheling | 50.00 to 51.00 |
| Machine shop turn. | 31.00 to 32.00 |
| Mixed bor. and turn. | 35.00 to 36.00 |
| Shoveling turnings | 35.00 to 36.00 |
| Cast iron borings | 35.00 to 36.00 |
| Cut struct'r'l & plates, 2 ft & under | 55.00 to 56.00 |
| Drop forge flashings | 50.00 to 51.00 |
| Low phos. punch'gs, plate | 52.00 to 53.00 |
| Foundry steel, 2 ft & under | 51.00 to 52.00 |
| No. 1 RR. heavy melting | 56.00 to 57.00 |
| Rails 2 ft and under | 71.00 to 72.00 |
| Rails 18 in. and under | 72.00 to 73.00 |
| Railroad grate bars | 40.00 to 41.00 |
| Steel axle turnings | 38.00 to 39.00 |
| Railroad cast | 55.00 to 56.00 |
| No. 1 machinery cast | 54.00 to 55.00 |
| Stove plate | 51.00 to 52.00 |
| Malleable | 59.00 to 60.00 |

### Youngstown

| | |
|---|---|
| No. 1 hvy. melting | $53.00 to $54.00 |
| No. 2 hvy. melting | 41.00 to 42.00 |
| No. 1 bundles | 53.00 to 54.00 |
| No. 2 bundles | 38.00 to 39.00 |
| Machine shop turn. | 31.00 to 32.00 |
| Shoveling turnings | 36.00 to 37.00 |
| Cast iron borings | 36.00 to 37.00 |
| Low phos. plate | 54.00 to 55.00 |

### Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $52.00 to $53.00 |
| No. 2 hvy. melting | 41.00 to 42.00 |
| No. 1 busheling | 52.00 to 53.00 |
| No. 1 bundles | 52.00 to 53.00 |
| No. 2 bundles | 37.00 to 38.00 |
| Machine shop turn. | 29.00 to 30.00 |
| Mixed bor. and turn. | 30.00 to 31.00 |
| Shoveling turnings | 31.00 to 32.00 |
| Cast iron borings | 31.00 to 32.00 |
| Low phos. plate | 57.00 to 58.00 |
| Scrap rails, random lgth. | 60.00 to 61.00 |
| Rails 2 ft and under | 70.00 to 71.00 |
| RR. steel wheels | 60.00 to 61.00 |
| RR. spring steel | 60.00 to 61.00 |
| RR. couplers and knuckles | 60.00 to 61.00 |
| No. 1 machinery cast | 53.00 to 54.00 |
| No. 1 cupola cast | 50.00 to 51.00 |

### Detroit

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $46.00 to $47.00 |
| No. 2 hvy. melting | 36.00 to 37.00 |
| No. 1 bundles, openhearth | 46.00 to 47.00 |
| No. 2 bundles | 32.00 to 33.00 |
| New busheling | 46.00 to 47.00 |
| Drop forge flashings | 45.50 to 46.50 |
| Machine shop turn. | 26.00 to 27.00 |
| Mixed bor. and turn. | 29.00 to 30.00 |
| Shoveling turnings | 29.00 to 30.00 |
| Cast iron borings | 29.00 to 30.00 |
| Low phos. punch'gs, plate | 46.00 to 47.00 |
| No. 1 cupola cast | 46.00 to 47.00 |
| Heavy breakable cast | 39.00 to 40.00 |
| Stove plate | 40.00 to 41.00 |
| Automotive cast | 50.00 to 51.00 |

### St. Louis

| | |
|---|---|
| No. 1 hvy. melting | $40.00 to $41.00 |
| No. 2 hvy. melting | 37.00 to 38.00 |
| No. 1 bundles | 43.50 to 44.50 |
| No. 2 bundles | 33.00 to 34.00 |
| Machine shop turn. | 26.00 to 27.00 |
| Cast iron borings | 28.00 to 29.00 |
| Shoveling turnings | 28.00 to 29.00 |
| No. 1 RR. hvy. melting | 51.50 to 52.50 |
| Rails, random lengths | 57.00 to 58.00 |
| Rails 18 in. and under | 65.00 to 66.00 |
| Locomotive tires uncut | 53.00 to 54.00 |
| Angles and splice bars | 53.00 to 54.00 |
| Std. steel car axles | 56.00 to 57.00 |
| RR. specialties | 55.00 to 56.00 |
| Cupola cast | 47.00 to 48.00 |
| Heavy breakable cast | 35.00 to 36.00 |
| Cast iron brake shoes | 42.00 to 43.00 |
| Stove plate | 40.00 to 41.00 |
| Cast iron car wheels | 53.50 to 54.50 |
| Rerolling rails | 68.00 to 69.00 |
| Malleable | 58.00 to 59.00 |
| Unstripped motor blocks | 35.00 to 36.00 |

### Boston

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $38.00 to $39.00 |
| No. 2 hvy. melting | 30.00 to 30.50 |
| No. 1 bundles | 38.00 to 39.00 |
| No. 2 bundles | 29.00 to 29.50 |
| No. 1 busheling | 38.00 to 39.00 |
| Elec. furnace, 3 ft & under | 40.00 to 41.00 |
| Machine shop turn. | 24.00 to 24.50 |
| Mixed bor. and short turn. | 27.00 to 27.50 |
| Shoveling turnings | 28.00 to 28.50 |
| Clean cast chem. borings | 31.00 to 32.00 |
| No. 1 machinery cast | 45.50 to 46.00 |
| Mixed cupola cast | 40.00 to 41.00 |
| Heavy breakable cast | 42.50 to 43.00 |
| Stove plate | 39.00 to 40.00 |
| Unstripped motor blocks | 25.50 to 26.00 |

### New York

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $44.00 to $45.00 |
| No. 2 hvy. melting | 35.00 to 36.00 |
| No. 2 bundles | 32.00 to 34.00 |
| Machine shop turn. | 25.00 to 26.00 |
| Mixed bor. and turn. | 25.00 to 26.00 |
| Shoveling turnings | 29.00 to 30.00 |
| Clean cast chem. borings | 31.00 to 32.00 |
| No. 1 machinery cast | 49.00 to 50.00 |
| Mixed yard cast | 46.00 to 47.00 |
| Charging box cast | 46.00 to 47.00 |
| Heavy breakable cast | 46.00 to 47.00 |
| Unstripped motor blocks | 33.00 to 34.00 |

### Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $36.00 to $37.00 |
| No. 2 hvy. melting | 34.00 to 35.00 |
| No. 1 bundles | 36.00 to 37.00 |
| No. 2 bundles | 25.00 to 26.00 |
| No. 1 busheling | 36.00 to 37.00 |
| Machine Shop turn. | 27.00 to 28.00 |
| Shoveling turnings | 29.00 to 30.00 |
| Cast iron borings | 21.50 to 22.50 |
| Electric furnace bundles | 44.00 to 45.00 |
| Bar crops and plates | 52.00 to 53.00 |
| Structural and plate, 2 ft | 51.00 to 52.00 |
| No. 1 RR. hvy. melting | 48.00 to 49.00 |
| Scrap rails, random lgth. | 59.00 to 60.00 |
| Rails, 18 in. and under | 62.00 to 63.00 |
| Angles & splice bars | 57.00 to 58.00 |
| Rerolling rails | 65.00 to 66.00 |
| No. 1 cupola cast | 48.50 to 49.50 |
| Stove plate | 47.00 to 48.00 |
| Charging box cast | 32.00 to 33.00 |
| Cast iron car wheels | 39.00 to 40.00 |
| Unstripped motor blocks | 37.50 to 38.50 |
| Mashed tin cans | 15.00 to 16.00 |

### Cincinnati

**Brokers buying prices per gross ton, on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $50.00 to $51.00 |
| No. 2 hvy. melting | 39.00 to 40.00 |
| No. 1 bundles | 50.00 to 51.00 |
| No. 2 bundles | 37.00 to 38.00 |
| Machine shop turn. | 30.00 to 31.00 |
| Mixed bor. and turn. | 31.50 to 32.50 |
| Shoveling turnings | 33.50 to 34.50 |
| Cast iron borings | 31.50 to 32.50 |
| Low phos. 18 in. & under | 55.00 to 56.00 |
| Rails, random lengths | 60.00 to 61.00 |
| Rails, 18 in. and under | 67.00 to 68.00 |
| No. 1 cupola cast | 46.00 to 47.00 |
| Hvy. breakable cast | 45.00 to 46.00 |
| Drop broken cast | 55.00 to 56.00 |

### San Francisco

| | |
|---|---|
| No. 1 hvy. melting | $42.00 |
| No. 2 hvy. melting | 40.00 |
| No. 1 bundles | 42.00 |
| No. 2 bundles | 35.00 |
| No. 3 bundles | 29.00 |
| Machine shop turn. | 24.00 |
| Cast iron borings | 25.00 |
| No. 1 RR. hvy. melting | 43.00 |
| No. 1 cupola cast | 48.00 |

### Los Angeles

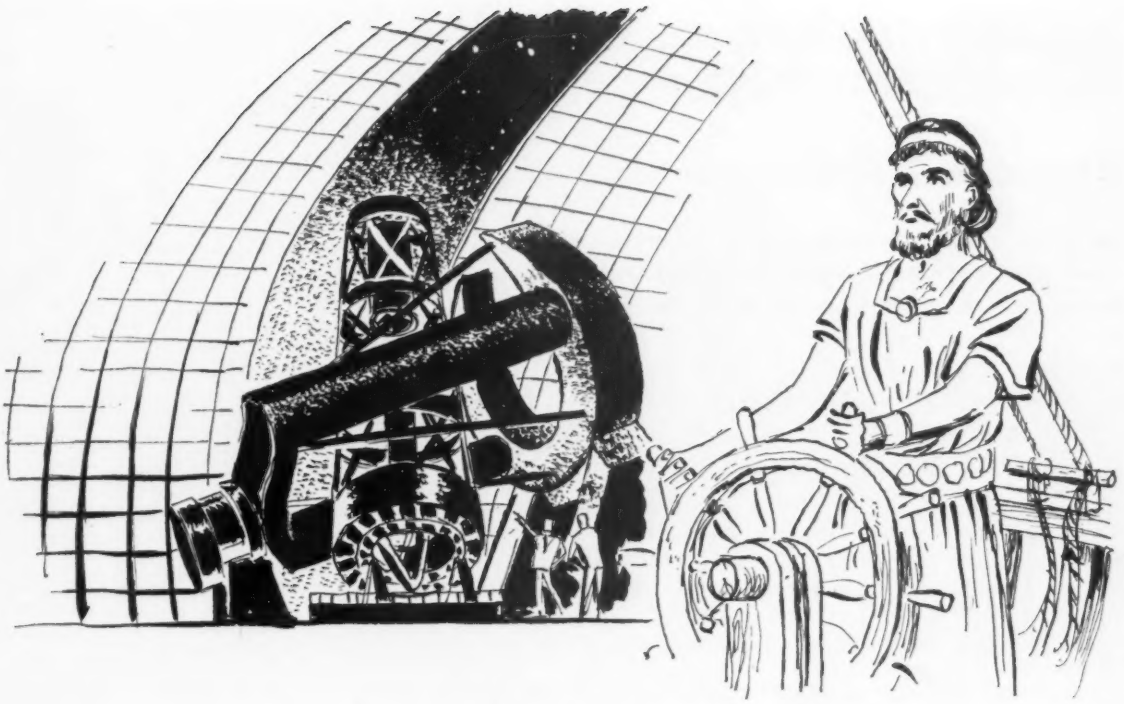
| | |
|---|---|
| No. 1 hvy. melting | $44.00 |
| No. 2 hvy. melting | 40.00 |
| No. 1 bundles | 43.00 |
| No. 2 bundles | 33.00 |
| No. 3 bundles | 29.00 |
| Machine shop turn. | 21.00 to 24.00 |
| Shoveling turnings | 24.00 |
| Cast iron borings | 24.00 |
| Elec. furn. 1 ft and under | 44.00 |
| No. 1 RR. hvy. melting | 44.00 |
| No. 1 cupola cast | 46.00 |

### Seattle

| | |
|---|---|
| No. 1 hvy. melting | $46.00 |
| No. 2 hvy. melting | 42.00 |
| No. 2 bundles | 33.00 |
| No. 3 bundles | 31.00 |
| No. 1 cupola cast | 45.00 |
| Mixed yard cast | 45.00 |

### Hamilton, Ont.

| | |
|---|---|
| No. 1 hvy. melting | $50.50 |
| No. 2 hvy. melting | 46.50 |
| No. 1 bundles | 50.50 |
| No. 2 bundles | 42.00 |
| Mixed steel scrap | 44.50 |
| Bushelings | 40.50 |
| Bush., new fact., prep'd | 48.50 |
| Bush., new fact., unprep'd | 44.50 |
| Machine shop turn. | 23.00 |
| Short steel turn. | 27.50 |
| Mixed bor. and turn. | 24.00 |
| Rails, rerolling | 58.50 |
| Cast scrap | 50.00 |



# Seeing Stars

For centuries man has studied the heavens,
watching the stars to give direction to his caravels and
caravans. The study of astronomy, started in biblical times,
was developed by the Greeks into a coherent science.
In 1609 Galileo devised his telescope and used it
for a new understanding of our solar system.

Today's great 200-inch reflector on Mt. Palomar,
as well as innumerable types and sizes of telescopes, microscopes,
field glasses and other optical instruments using lens systems,
depend upon steel for their construction and operation.

Thus, in science—as in industry, transportation, agriculture,
defense, and almost every avenue of man's activities—
steel is the indispensable ingredient.
To insure its constant supply in millions of tons,
a never-failing stock of scrap must be continuously maintained.

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# Brass Mills Orders Slump

**But situation not considered bad . . . Many mills welcome relief from customer pressure for immediate delivery . . . Expect buying to pick up after summer at the latest.**

◆ ORDERS FOR brass mill products are definitely off. But the situation is far from critical. In fact, it's not even bad.

Most mills readily admit that business is off. But in the same breath they declare that they are still able to sell everything they turn out. June production is almost 100 pct accounted for. And mills insist they could sell more if they could turn it out.

Many even look on the slight slump as a bit of welcome relief from customer pressure for immediate delivery which has been prevalent up to this time.

Reason for the sales slump, estimated at about 15 pct by one major mill, is two-fold. Automotive cutbacks are the principal cause. Auto industry accounts for about 20 pct of brass mill products. Reduction in auto output is reflected proportionately in business of the mills.

Other reason is the fact that many customers are living off inventories as much as possible in anticipation of lower prices. Brass mill products are based to a great extent on cost of principal raw material—copper. With London Metal Exchange and custom smelter copper price dropping, and the chance of producers copper reversing its upward price trends good, pressure on brass mill products prices seems likely to be relieved.

Mills are confident that their customers won't be off the market for too long. If copper front remains quiet, they look for business to pick up right after vacation season when consumers will be forced to replace inventories they are currently using up.

However, its a tossup right now as to how quiet the summer is going to be. Current contracts between major copper producers and unions run out June 30. With Mine, Mill and Smelter Workers challenged by United Steelworkers and fighting for its very existence, negotiating sessions are sure to be lively affairs. If it begins to look like a strike is imminent, the brass mills are liable to find themselves beseiged by orders. And if the strike materializes, it will be a repetition, to a slightly lesser degree, of 1955.

**LEAD** . . . Lead market in U. S. is steady. Sales are considered good, with demand coming from wide variety of industries. Big news this week is the added strength in London.

U. S. government is developing a plan to exchange surplus farm products for lead of foreign origin to be placed in a supplemental stockpile. This news served to strengthen a market that has been on the weak side. Thus far the extent of the government purchases is unknown.

It is expected, however, that they will not be sizable enough to upset the price applecart in this country. U. S. prices are pegged at a level sufficient to bring pivotal supplies from Mexico and Canada to U. S. instead of London. Should London price advance too far, U. S. price would be bound to follow. This, however, is not expected to happen.

**TIN** . . . Market is currently colorless with price basically unchanged. However, indications are that there may be some trouble in the offing. As expected, negotiations between management and the dock workers in Penang, Malaya got underway before the deadline, thus averting a strike. But the possibility of a work stoppage is not over yet. Labor unrest is the rule rather than the exception in Malaya right now. Some 300,000 rubber plantation workers are in the midst of a slow-down, and are seriously considering an all-out strike to emphasize demands for higher wages. Although the two unions—rubber and docks—are not related closely, action of one could well set the example for the other.

And at the mines all is not well either. Despite the fact that the government has passed an ordinance permitting tax deductions for unsuccessful prospecting, and the acting chief inspector of mines has indicated that he cannot "imagine" Malaya being mined out, producers are still worried about exhausting deposits. Latest to complain is British owned Guthrie & Co., Ltd. Company claims that the danger is a very real one and calls on the government for additional assistance in prospecting new areas.

In Bolivia, one of the world's first 5 producers, some 2000 mine workers are on strike because demands for a 40 pct pay increase were turned down. They had previously been given a 40 pct boost in wages in March. Country is in the grip of a raging inflation. More work stoppages and difficulties can be expected.

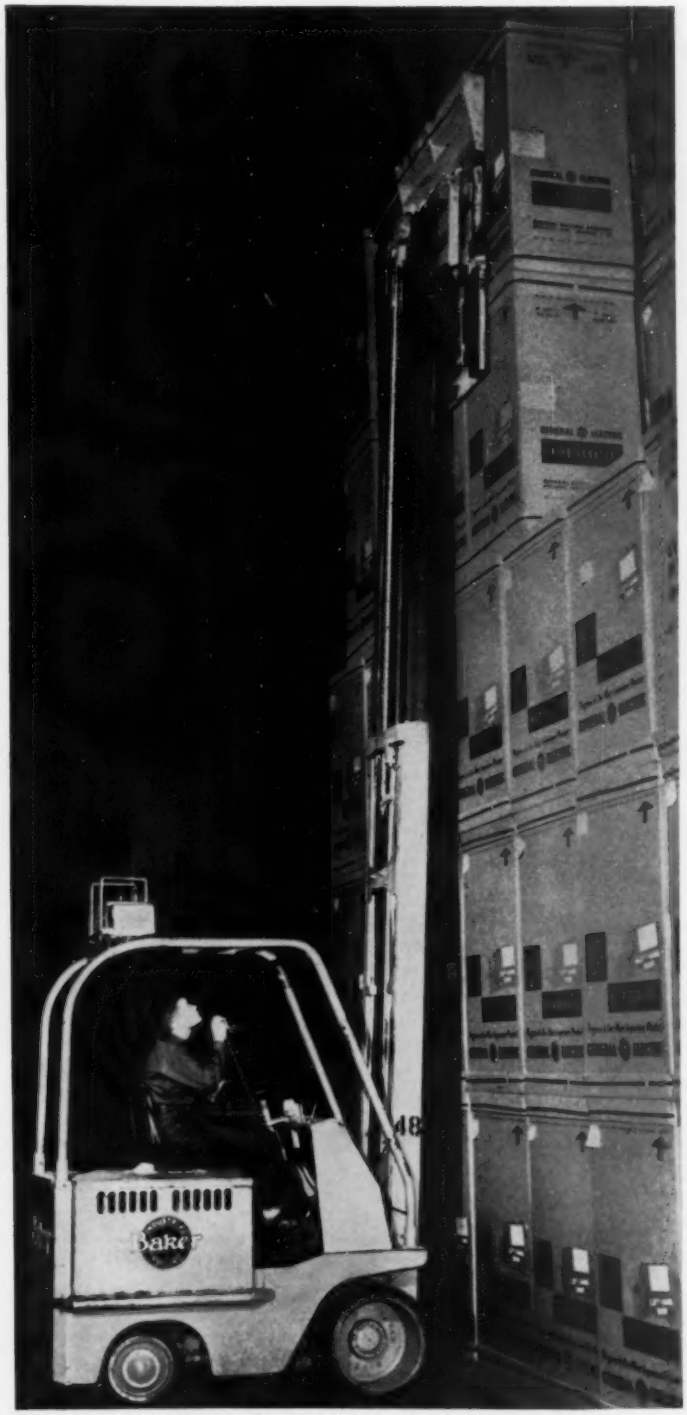
**ALUMINUM** . . . The Aluminum Assn. reports primary production of aluminum in the U. S. during April was over 289 million lb, down from the 291 million turned out the previous month. However, March 1956 was an all time record, and the drop was to be expected. Total production for the first quarter 1956 was over 838 million lb, an all time record quarter.

## Daily Nonferrous Metal Prices

*(Cents per lb except as noted)*

| | May 16 | May 17 | May 18 | May 19 | May 21 | May 22 |
|---|---|---|---|---|---|---|
| Copper, electro, Conn. | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 |
| Copper, Lake, delivered | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 | 46.00 |
| Tin, Straits, New York | 97.625 | 97.25 | 97.125 | .... | 96.875 | 96.875* |
| Zinc, East St. Louis | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 | 13.50 |
| Lead, St. Louis | 15.80 | 15.80 | 15.80 | 15.80 | 15.80 | 15.80 |

*Note: Quotations are going prices.* **Tentative*



The same trucks that do the stacking also transport appliances from end of assembly line to storage, and from storage to loading docks. Two-way radio dispatch system expedites movement.

# 13 BAKER TRUCKS give General Electric Appliance Park "floor-to-ceiling" utilization of warehouse space!

Every cubic foot of storage space in this mammoth appliance warehouse is utilized by compact stacking. Baker Trucks, equipped with a special lift attachment that handles cartons or crates without forks, help do the job.

General Electric has a fleet of 13 such trucks at this installation and is adding 5 more. This new concept in appliance handling completely eliminates the use of pallets—which would have meant an additional investment 8 or 9 times the cost of the trucks. The absence of forks and pallets makes possible stacking one tier higher and reduces aisle space required, thus increasing storage capacity more than 25%.

The trucks have a total lift of 242 inches. Appliances are handled 4 per load for the bottom 2 tiers, and 2 per load for upper tiers. Gravity sliding back-rest aligns loads perfectly with tiers below and protects them from impact damage. Side-shifter butts loads snugly against adjacent stack for lateral alignment.

*A Baker handling engineer can help you devise similar cost-saving methods in your plant or warehouse. Call your nearest Baker representative or write us direct.*

Baker®
handling equipment

**THE BAKER-RAULANG COMPANY**
1227 WEST 80th STREET • CLEVELAND 2, OHIO

A subsidiary of Otis Elevator Company

6E-6

# Nonferrous Prices *(Effective May 22, 1956)*

## MILL PRODUCTS

*(Cents per lb, unless otherwise noted)*

### ALUMINUM

*(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)*

#### Flat Sheet (Mill Finish) and Plate

*("F" temper except 6061-0)*

| Alloy | .032 | .081 | .136-.249 | .250-3. |
|---|---|---|---|---|
| 1100, 3003 | 42.3 | 40.2 | 39.0 | 38.0 |
| 5052 | 49.8 | 44.9 | 43.2 | 41.4 |
| 6061-0 | 46.9 | 42.7 | 40.9 | 40.8 |

#### Extruded Solid Shapes

| Factor | 6063 T-5 | 6062 T-6 |
|---|---|---|
| 6-8 | 43.1-44.8 | 58.1-61.7 |
| 12-14 | 43.8-45.2 | 59.0-63.3 |
| 24-26 | 46.8-47.2 | 69.2-73.6 |
| 36-38 | 55.1-55.7 | 92.0-95.8 |

#### Screw Machine Stock—2011-T-3

| Size" | ¼ | ⅜-⅝ | ¾-1 | 1¼-1½ |
|---|---|---|---|---|
| Price | 56.0 | 54.9 | 53.6 | 51.6 |

#### Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

| Length" → | 72 | 96 | 120 | 144 |
|---|---|---|---|---|
| .019 gage | $1.310 | $1.742 | $2.175 | $2.605 |
| .024 gage | 1.630 | 2.177 | 2.707 | 3.247 |

### MAGNESIUM

*(f.o.b. shipping pt., carload frt. allowed)*

#### Sheet and Plate

| Type→ Gage→ | .250-3.00 | .250-2.00 | .188 | .081 | .032 |
|---|---|---|---|---|---|
| FS1 Stand. Grade | | 65.6 | 66.5 | 75 | 100 |
| FS1 Spec. | | 88.9 | 91.1 | 103.5 | 163.1 |
| Tread Plate | | 67.8 | 68.9 | | |
| Tooling Plate | 70.2 | | | | |

#### Extruded Shapes

| factor → | 6-8 | 12-14 | 24-26 | 36-38 |
|---|---|---|---|---|
| Comm. Grade (FS) | 66.4-69.0 | 67.5-69.6 | 72.1-72.7 | 84.9-85.8 |
| Spec. Grade (AZ31B) | 81.4-84.0 | 82.5-84.6 | 87.1-87.7 | 99.9-100.8 |

#### Alloy Ingot

AZ91B (Die Casting) ..... 35 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 39.25(Velasco,Tex.)

### NICKEL, MONEL, INCONEL

*(Base prices, f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 102 | 83 | 99 |
| Strip, CR | 102 | 92 | 125 |
| Rod, Bar, HR | 87 | 74 | 93 |
| Angles, HR | 87 | 74 | 93 |
| Plate, HR | 97 | 87 | 95 |
| Seamless tube | 122 | 110 | 153 |
| Shot, blocks | | 71 | |

### COPPER, BRASS, BRONZE

*(Freight included on 500 lbs)*

| | Sheet | Wire | Rod | Tube |
|---|---|---|---|---|
| Copper | 68.63 | | | 68.82 |
| Brass, 70/30 | 56.60 | 57.14 | | 59.51 |
| Brass, Low | 61.35 | 61.89 | 61.29 | 64.16 |
| Brass, R L | 63.07 | 63.61 | 63.01 | 65.88 |
| Brass, Naval | 59.80 | 65.06 | 54.11 | 62.96 |
| Muntz Metal | 57.84 | 51.85 | 53.65 | |
| Comm. Bz. | 65.33 | 65.87 | 65.27 | 67.89 |
| Mang. Bz. | 63.54 | 66.19 | 57.64 | |
| Phos. Bz. 5% | 86.79 | 84.44 | 87.29 | |

### TITANIUM

(10,000 *lb base, f.o.b. mill*)

Sheet and strip, commercially pure, $12.10-$12.60; alloy, $15.00-$15.75; Plate, HR, commercially pure, $10.00-$10.50; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.00-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.55-$7.80; alloy, $7.55-$7.75.

## PRIMARY METAL

*(Cents per lb, unless otherwise noted)*

Aluminum ingot, 99+%, 10,000 lb. freight alloyed ..... 25.90
Aluminum pig ..... 24.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be $43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be ..... $74.75
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Cobalt, 97-99% (per lb) .... $2.60 to $2.67
Copper, electro, Conn. Valley ..... 46.00
Copper, Lake, delivered ..... 46.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz...$100 to $120
Lead, St. Louis ..... 15.80
Lead, New York ..... 16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig ..... 33.75
ingot ..... 34.50
Magnesium, sticks, 100 to 500 lb... 56.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $265 to $267
Nickel electro ..... 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel ..... 60.75
Palladium, dollars per troy oz. $23 to $24
Platinum, dollars per troy oz..$97 to $107
Silver, New York, cents per troy oz. 90.75
Tin, New York ..... 96.875*
Titanium sponge, grade A-1 .....$3.25
Zinc, East St. Louis ..... 13.50
Zinc, New York ..... 14.00
Zirconium sponge ..... $10.00
*Tentative

## REMELTED METALS

### Brass Ingot

*(Cents per lb delivered, carloads)*

85-5-5-5 ingot
No. 115 ..... 40.50
No. 120 ..... 39.50
No. 123 ..... 38.50
80-10-10 ingot
No. 305 ..... 43.75
No. 315 ..... 42.00
88-10-2 ingot
No. 210 ..... 55.75
No. 215 ..... 52.00
No. 245 ..... 46.75
Yellow ingot
No. 405 ..... 31.75
Manganese bronze
No. 421 ..... 36.25

### Aluminum Ingot

*(Cents per lb del'd 30,000 lb and over)*

95-5 aluminum-silicon alloys
0.30 copper max. .....27.00-28.00
0.60 copper max. ..... 26.75-27.75
Piston alloys (No. 122 type) .26.75-28.00
No. 12 alum. (No. 2 grade)...24.75-26.00
108 alloy .....25.00-26.00
195 alloy .....26.75-28.00
13 alloy (0.60 copper max.) ...26.75-27.75
AXS-679 .....25.00-26.00

### Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% ..... 25.00-26.00
Grade 2—92-95% ..... 24.25-25.25
Grade 3—90-92% ..... 23.50-24.50
Grade 4—85-90% ..... 23.00-23.75

## SCRAP METALS

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 42 | 41¼ |
| Yellow brass | 31¼ | 29 |
| Red brass | 37 | 36¼ |
| Comm. bronze | 38½ | 37¾ |
| Mang. bronze | 28⅞ | 28⅛ |
| Yellow brass rod ends | 31 | .... |

### Custom Smelters Scrap

*(Cents per pound carload lots, delivered to refinery)*

No. 1 copper wire ..... 37
No. 2 copper wire ..... 35
Light copper ..... 33
*Refinery brass ..... 33½
* Dry copper content.

### Ingot Makers Scrap

*(Cents per pound carload lots, delivered to refinery)*

No. 1 copper wire ..... 37
No. 2 copper wire ..... 35½
Light copper ..... 33
No. 1 composition ..... 31
No. 1 comp. turnings ..... 30½
Hvy. yellow brass solids ... 22
Brass pipe ..... 22½
Radiators ..... 23
*Aluminum*
Mixed old cast. ..... 16 —17
Mixed new clips ..... 17 —18
Mixed turnings, dry ..... 16 —17

### Dealers' Scrap

*(Dealers' buying price, f.o.b. New York in cents per pound)*

#### Copper and Brass

No. 1 heavy copper and wire ..... 35
No. 2 heavy copper and wire ..... 32 —32½
Light copper ..... 30 —30½
New type shell cuttings ..... 28 —28½
Auto radiators (unsweated) .. 20 —20½
No. 1 composition ..... 27½—28
No. 1 composition turnings .. 26½—27
Unlined red car boxes ..... 20 —21
Cocks and faucets ..... 21 —21½
Clean heavy yellow brass ... 18½—19
Brass pipe ..... 22½—23
New soft brass clippings .... 23½—24
No. 1 brass rod turnings .... 21 —21½

#### Aluminum

Alum. pistons and struts .... 13½—14
Aluminum crankcases ..... 13 —13½
1100 (2S) aluminum clippings 15½—16
Old sheet and utensils ..... 12½—13
Borings and turnings..... 8 — 8½
Industrial castings ..... 13 —13½
2024 (24S) clippings ..... 14½—15

#### Zinc

New zinc clippings ..... 8 — 8½
Old zinc ..... 5 — 5½
Zinc routings ..... 3¾
Old die cast scrap ..... 2¾— 3

#### Nickel and Monel

Pure nickel clippings ..... $1.75-$2.00
Clean nickel turnings .... $1.65-$1.85
Nickel anodes ..... $1.75-$2.00
Nickel rod ends ..... $1.75-$2.00
New Monel clippings ..... 80-90
Clean Monel turnings ..... 65-70
Old sheet Monel ..... 70-80
Nickel silver clippings, mixed 25
Nickel silver turnings, mixed 21

#### Lead

Soft scrap lead ..... 12½—13
Battery plates (dry) ..... 7 — 7¼
Batteries, acid free ..... 4½

#### Miscellaneous

Block tin ..... 83 —84
No. 1 pewter ..... 62½—63
Auto babbitt ..... 48 —49
Mixed common babbitt ..... 13½—14
Solder joints ..... 18½—19
Siphon tops ..... 48
Small foundry type ..... 15¾—16
Monotype ..... 15 —15½
Lino. and stereotype ..... 13½—14
Electrotype ..... 13 —13¼
Hand picked type shells ..... 10½—11
Lino. and stereo. dross ..... 5¾— 6
Electro. dross ..... 4¾— 5

IRON AGE

# STEEL PRICES

*(Effective May 22, 1956)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BILLETS, BLOOMS, SLABS | | | PILING | SHAPES STRUCTURALS | | | STRIP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide-Flange | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot-rolled | Alloy Cold-rolled |
| EAST | Bethlehem, Pa. | | | $96.00 *B3* | | 4.65 *B3* | 6.80 *B3* | 4.65 *B3* | | | | | | |
| | Buffalo, N. Y. | $68.50 *B3* | $84.50 *R3 B3* | $96.00 *R3, B3* | 5.45 *B3* | 4.65 *B3* | 6.80 *B3* | 4.65 *B3* | 4.325 *R3,B3* | 6.25 *B3* 6.25 *R7,S10* | 6.425 *B3* | 9.10 *B3* | | |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Harrison, N. J. | | | | | | | | | | | | | 13.45 *C11* |
| | Conshohocken, Pa. | | | | | | | | 4.375 *A2* | 6.30 *A2* | 6.425 *A2* | | | |
| | New Bedford, Mass. | | | | | | | | | 6.70 *R6* | | | | |
| | Johnstown, Pa. | $68.50 *B3* | $84.50 *B3* | $96.00 *B3* | | 4.65 *B3* | 6.80 *B3* | | | | | | | |
| | Boston, Mass. | | | | | | | | | 6.80 *T8* | | | | 13.80 *T8* |
| | New Haven, Conn. | | | | | | | | | 6.70 *D1 A5* | | | | |
| | Phoenixville, Pa. | | | | | 5.15 *P2* | | 5.15 *P2* | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 4.325 *B3* | 6.25 *B3* | 6.425 *B3* | 9.10 *B3* | | |
| | Bridgeport, Wallingford, Conn. | $73.50 *N8* | $89.50 *N8* | | | | | | 4.625 *N8* | 6.70 *W1* | | | 7.50 *N8* | |
| | Pawtucket, R. I. Worcester, Mass. | | | | | | | | | 6.80 *N7 A5* | | | | *A5* 13.80 *N7* |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 4.50 *L1* | | | | | |
| | Ashland, Ky | | | | | | | | 4.325 *A7* | | | | | |
| | Canton-Massillon, Dover, Ohio | | $86.50 *R3* | $96.00 *R3* | | | | | | | | | | 13.45 *G4* |
| | Chicago, Ill. | $68.50 *U1* | $84.50 *R3, U1,W8* | $96.00 *R3, U1,W8* | 5.45 *U1* | 4.60 *U1, W8* | 6.75 *U1, Y1* | 4.60 *U1* | 4.35 *A1* 4.325 *N4,W8* | 6.35 *A1,T8* | | | 7.20 *W8* | 13.45 *T8* |
| | Cleveland, Ohio | | | | | | | | | 6.25 *A5,J3* | | 9.30 *A5* | | 13.45 *A5* |
| | Detroit, Mich | | | $96.00 *R5* | | | | | 4.425 *G3,M2* | 6.35 *D1,D2, G3 M2,P11* | 6.525 *G3* | 9.20 *D2, G3* | | |
| | Duluth, Minn. | | | | | | | | | | | | | |
| | Gary, Ind Harbor, Indiana | $68.50 *U1* | $84.50 *U1* | $96.00 *U1, Y1* | 5.45 *I3* | 4.60 *U1, I3* | 6.75 *U1, I3* | | 4.325 *I3, U1,Y1* | 6.35 *I3* 6.25 *Y1* | 6.425 *I3, U1,Y1* | 9.30 *Y1* | 7.20 *Y1, U1* | |
| | Sterling, Ill. | | | | | | | | 4.425 *N4* | | | | | |
| | Indianapolis, Ind | | | | | | | | | 6.40 *C5* | | | | |
| | Newport, Ky. | | | | | | | | | | | | 7.20 *N5* | |
| | Middletown, Ohio | | | | | | | | | 6.45 *A7* | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | $68.50 *C10* | $84.50 *C10* | $96.00 *C10* | | | | | 4.325 *S1, R3* | 6.25 *S1, R3,T4* | 6.425 *S1, R3* | 9.10 *S1, R3* | 7.20 *S1* | 13.45 *S1* |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | $68.50 *U1, J3* | $84.50 *J3, U1,C11* | $96.00 *U1, C11* | 5.45 *U1* | 4.60 *U1, J3* | 6.75 *U1, J3* | 4.60 *U1* | 4.325 *P6* | 6.25 *S7,B4* | | | 7.20 *S9* | 13.45 *S9* |
| | Portsmouth, Ohio | | | | | | | | | | | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | | 4.60 *W3* | | | 4.325 *W3* | 6.25 *F3,W3* | 6.425 *W3* | 9.10 *W3* | | |
| | Youngstown, Ohio | | $84.50 *C10* | $96.00 *Y1, C10* | | | 6.75 *Y1* | | 4.325 *U1, Y1* | 6.25 *Y1,C5* | 6.425 *U1, Y1* | 9.30 *Y1* | 7.20 *U1, Y1* | 13.45 *C5* |
| WEST | Fontana, Cal. | 78.00 *K1* | 94.00 *K1* | 117.00 *K1* | | 5.30 *K1* | 7.40 *K1* | 5.45 *K1* | 5.125 *K1* | 8.00 *K1* | 7.575 *K1* | | 8.95 *K1* | |
| | Geneva, Utah | | $84.50 *C7* | | | 4.60 *C7* | 6.75 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | 4.70 *S2* | 6.85 *S2* | | | | 6.675 *S2* | | 7.45 *S2* | |
| | Los Angeles, Torrance, Cal. | | $94.00 *B2* | $116.00 *B2* | | 5.30 *C7, B2* | 7.45 *B2* | | 5.075 *C7, B2* | 8.30 *C1* | | | 8.40 *B2* | |
| | Minnequa, Colo. | | | | | 4.90 *C6* | | | 5.425 *C6* | | | | | |
| | Portland, Ore. | | | | | 5.35 *O2* | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | $94.00 *B2* | | | 5.25 *B2, P9* | 7.40 *B2* | | 5.075 *B2, C7* | | | | | |
| | Seattle, Wash. | | $98.00 *B2* | | | 5.35 *B2* | 7.50 *B2* | | 5.325 *B2* | | | | | |
| SOUTH | Atlanta, Ga. | | | | | | | | 4.525 *A8* | | | | | |
| | Fairfield, Ala. City, Birmingham, Ala. | $68.50 *T2* | $84.50 *T2* | | | 5.10 *C16* 4.60 *R3,T2* | 6.75 *T2* | | 4.325 *R3,T2* 4.825 *C10* | | 6.425 *T2* | | | |
| | Houston, Lone Star, Texas | $74.50 *L3* | $89.50 *S2* | $101.00 *S2* | | 4.70 *S2* | 6.85 *S2* | | | | 6.675 *S2* | | 7.45 *S2* | |

IRON AGE

# STEEL PRICES

*(Effective May 22, 1956)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | SHEETS | | | | | | | | | WIRE ROD | TINPLATE† | | BLACK PLATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-rolled 18 ga. & hvyr. | Cold-rolled | Galvanized 10 ga. | Enameling 12 ga. | Long Terne 10 ga. | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | Hot-rolled 19 ga. | | Coke* 1.25-lb. base box | Electro* 0.25-lb. base box | Hollowware Enameling 29 ga. |
| EAST | Bethlehem, Pa. | | | | | | | | | | | | | |
| | Buffalo, N. Y. | 4.325 *B3* | 5.325 *B3* | | | | 6.375 *B3* | 7.875 *B3* | | | 5.375 *W6* | † Special coated m/g. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢. | | |
| | Claymont, Del. | | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | | |
| | Conshohocken, Pa. | 4.375 *A2* | 5.375 *A2* | | | | 6.425 *A2* | | | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | | |
| | Johnstown, Pa. | | | | | | | | | | 5.375 *B3* | | | |
| | Fairless, Pa. | 4.375 *UI* | 5.375 *UI* | | | | 6.425 *UI* | 7.925 *UI* | | | | $9.70 *UI* | $8.40 *UI* | |
| | New Haven, Conn. | | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | | |
| | Sparrows Pt., Md. | 4.325 *B3* | 5.325 *B3* | 5.85 *B3* | | | 6.375 *B3* | 7.875 *B3* | 8.60 *B3* | | 5.475 *B3* | $9.70 *B3* | $8.40 *B3* | |
| | Worcester, Mass. | | | | | | | | | | 5.675 *A5* | | | |
| | Trenton, N. J. | | | | | | | | | | | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | | 5.55 *L1* | | | |
| | Ashland, Ky. | 4.325 *A7* | | 5.85 *A7* | 5.90 *A7* | | | | | | | | | |
| | Canton-Massillon, Dover, Ohio | | | 5.85 *R1, R3* | | | | | | | | | | |
| | Chicago, Joliet, Ill. | 4.55 *A1* 4.325 *W8* | | | | | 6.375 *UI* | | | | 5.375 *N4* 5.375 *A5, R3* | | | |
| | Sterling, Ill. | | | | | | | | | | 5.475 *N4* | | | |
| | Cleveland, Ohio | 4.325 *J3, R3* | 5.325 *J3, R3* | | 5.90 *R3* | | 6.375 *J3, R3* | 7.875 *J3, R3* | | | 5.375 *A5* | | | |
| | Detroit, Mich. | 4.425 *G3, M2* | 5.425 *G3* 5.325 *M2* | | | | 6.475 *G3* | 7.975 *G3* | | | | | | |
| | Newport, Ky. | 4.325 *N5* | 5.325 *N5* | 5.85 *N5* | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 4.325 *I3, UI, YI* | 5.325 *I3, UI, YI* | 5.85 *UI, I3* | 5.90 *UI, I3* | 6.25 *UI* | 6.375 *YI, UI, I3* | 7.875 *UI, YI* | | | 5.375 *YI* | $9.60 *I3, UI, YI* | $8.30 *I3, UI, YI* | 7.05 *UI, YI* |
| | Granite City, Ill. | 4.525 *G2* | 5.525 *G2* | 6.05 *G2* | 6.10 *G2* | | | | | | | | $8.40 *G2* | 7.15 *G2* |
| | Kokomo, Ind. | | | 5.95 *C9* | | | | | | | 5.475 *C9* | | | |
| | Mansfield, Ohio | 4.325 *E2* | 5.325 *E2* | | | 6.25 *E2* | | | | | | | | |
| | Middletown, Ohio | | 5.325 *A7* | 5.85 *A7* | 5.90 *A7* | 6.25 *A7* | | | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | 4.325 *SI, R3, N3* | 5.325 *R3, N3* | 5.85 *R3* 6.85 *N3* | 5.90 *N3* | 6.25 *N3* | 6.375 *SI, R3* | 7.875 *R3* | | | | | $8.30 *R3* | |
| | Pittsburgh, Pa. Midland, Pa. Butler, Pa. | 4.325 *J3, UI, P6* | 5.325 *J3, UI, P6* | 5.85 *UI* | 5.90 *UI, A7* | | 6.375 *J3, UI* | 7.875 *UI* | 8.60 *UI* | | 5.025 *P6* 5.375 *A5* | $9.60 *J3, UI* | $8.30 *J3, UI* | 7.05 *UI* |
| | Portsmouth, Ohio | 4.325 *P7* | 5 325 *P7* | | | | | | | | 5.375 *P7* | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.325 *W3, W5* | 5.325 *W3, W5, F3* | 5.85 *W3, W5* | | 6.25 *W3, W5* | 6.375 *W3* | 7 875 *W3* | | | | $9.60 *W3, W5* | $8.30 *W3, W5* | 7.05 *F3, W5* |
| | Youngstown, Ohio | 4.325 *UI, YI* | 5.325 *YI* | | 5.90 *YI* | | 6.375 *UI, YI* | 7.875 *YI* | | | 5.375 *YI* | | | |
| WEST | Fontana, Cal. | 5.125 *KI* | 6.525 *KI* | | | | 7.175 *KI* | 9.075 *KI* | | | | $10.35 | $9.05 | $8.15 |
| | Geneva, Utah | 4.425 *C7* | | | | | | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | | 5.625 *S2* | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | | 6.175 *B2* | | | |
| | Minnequa, Colo. | | | | | | | | | | 5.625 *C6* | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.025 *C7* | 6.275 *C7* | 6.00 *C7* | | | | | | | 5.675 *C7* | $10.35 *C7* | $9.05 *C7* | |
| | Seattle, Wash. | | | | | | | | | | | | | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | | | | |
| | Fairfield, Ala. Alabama City, Ala. | 4.325 *R3, T2* | 5.325 *T2* | 5.85 *R3, T2* | | | 6.375 *T2* | | | 5.625 *R3* | 5.025 *R3* 5.375 *T2* | $9.70 *T2* | $8.40 *T2* | |
| | Houston, Tex. | | | | | | | | | | 5.625 *S2* | | | |

IRON AGE

# STEEL PRICES

*(Effective May 22, 1956)*

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Steel | Reinforcing | Cold Finished | Alloy Hot rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfr's. Bright |
| EAST | Bethlehem | | | | 5.575 *B3* | 7.425 *B3* | 6.80 *B3* | | | | | |
| | Buffalo, N. Y. | 4.65 *B3,R3* | 4.65 *B3,R3* | 6.30 *B5* | 5.575 *B3,R3* | 7.425 *B3,B5* | 6.80 *B3* | 4.50 *B3,R3* | | | | 6.60 *W6* |
| | Claymont, Del. | | | | | | | 5.35 *C4* | | 6.30 *C4* | 6.725 *C4* | |
| | Coatesville, Pa. | | | | | | | 4.80 *L4* | | 6.30 *L4* | 6.725 *L4* | |
| | Conshohocken, Pa. | | | | | | | 4.50 *A2* | 5.575 *A2* | | 6.725 *A2* | |
| | Harrisburg, Pa. | | | | | | | 5.10 *P2* | 5.575 *C3* | | | |
| | Hartford, Conn. | | | 6.75 *R3* | | 7.725 *R3* | | | | | | |
| | Johnstown, Pa. | 4.65 *B3* | 4.65 *B3* | | 5.575 *B3* | | 6.80 *B3* | 4.50 *B3* | | 6.30 *B3* | 6.725 *B3* | 6.60 *B3* |
| | Fairless, Pa. | 4.80 *U1* | 4.80 *U1* | | 5.725 *U1* | | | | | | | |
| | Newark, N. J. | | | 6.70 *W10* | | 7.60 *W10* | | | | | | |
| | Camden, N. J. | | | 6.70 *P10* | | | | | | | | |
| | Bridgeport, Putnam, Conn. | 4.80 *N8* | | 6.80 *W10* | 5.725 *N8* | | | 4.750 *N8* | | | | |
| | Sparrows Pt., Md. | | 4.65 *B3* | | | | | 4.50 *B3* | | 6.30 *B3* | 6.725 *B3* | 6.70 *B3* |
| | Palmer, Worcester, Readville, Mass. Milton, Pa. | 4.80 *M7* | 4.80 *M7* | 6.70 *W11* 6.45 *C14* 6.70 *B5* | | 7.725 *A5 B5* | | 4.50 *R3* | | | | 6.90 *A5* 6.90 *W6* |
| | Spring City, Pa. | | | 6.35 *K4* | | 7.60 *K4* | | | | | | |
| MIDDLE WEST | Alton, Ill. | 4.85 *L1* | | | | | | | | | | 6.775 *L1* |
| | Ashland, Newport, Ky. | | | | | | | 4.50 *A7,N5* | | 6.30 *N5* | | |
| | Canton-Massillon, Mansfield, Ohio | 4.75 *R3* | | 6.25 *R2,R3* | 5.575 *R3,T5* | 7.425 *R2,R3, T5* | | 4.50 *E1* | | | | |
| | Chicago, Joliet, Ill. | 4.65 *U1, N4,W8,R3,* 5.15 *P13* | 4.65 *N4,R3,* 5.15 *P13* | 6.25 *B5,W8, W10,A5,L2* | 5.575 *U1,R3, W8* | 7.425 *A5,W8, W10,L2,B5* | | 4.50 *U1,W8, I3,R3* 4.725 *A1* | 5.575 *U1* | 6.30 *U1* | 6.725 *U1* | 6.60 *A5,R3, N4,W7* |
| | Cleveland, Ohio | 4.65 *R3* | 4.65 *R3* | 6.25 *A5,C13* | | 7.425 *A5,C13* | 6.80 *R3* | 4.60 *J3,R3* | 5.575 *J3* | | 6.725 *R3,J3* | 6.60 *A5, C13* |
| | Detroit, Mich. | 4.75 *G3* | 4.75 *G3* | 5.90 *R5* 6.45 *B5* 6.50 *P3* 6.10 *P8* | 5.575 *R5* 5.675 *G3* | 7.425 *R5* 7.625 *B5,P3, P8* | 6.90 *G3* | 4.60 *G3* | | | 6.825 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 6.60 *A5* |
| | Gary, Ind. Harbor, Crawfordsville | 4.65 *I3, U1, Y1* | 4.65 *I3, U1, Y1* | 6.25 *M5,R3* | 5.575 *I3, U1, Y1* | 7.425 *M5, R3* | 6.80 *U1,I3, Y1* | 4.50 *I3, U1, Y1* | 5.575 *I3* | 6.30 *U1,Y1* | 6.725 *U1, I3,Y1* | 6.35 *M4* |
| | Granite City, Ill. | | | | | | | 4.70 *G2* | | | | |
| | Kokomo, Ind. | | | | | | | | | | | 6.70 *C9* |
| | Sterling, Ill. | 4.75 *N4* | 4.75 *N4* | | | | | | | | | 6.70 *N4* |
| | Niles, Warren, Ohio Sharon, Pa. | 4.65 *R3,C10* | | 6.25 *C10* | 5.75 *C10* | 7.425 *C10* | 6.80 *R3* | 4.50 *S1,R3* | | 6.30 *S1* | 6.725 *S1* | |
| | Pittsburgh, Pa. Midland, Pa. | 4.65 *J3, U1, C11* | 4.65 *J3, U1* | 6.25 *A5,C8, C11,J3, W10,B4,R3* | 5.575 *U1,C11* | 7.425 *A5,C11, W10,C8,R3* | 6.80 *J3, U1* | 4.50 *J3, U1* | 5.575 *U1* | 6.30 *U1* | 6.725 *J3, U1* | 6.60 *A5,J3, P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 6.60 *P7* |
| | Weirton, Wheeling, Follansbee, W. Va. | 4.65 *W3* | | | | | | 4.50 *W3,W5* | | | | |
| | Youngstown, Ohio | 4.65 *U1,Y1, C10,R3* | 4.65 *U1,Y1, R3* | 6.25 *Y1,U1* | 5.575 *U1,Y1, C10* | 7.425 *Y1,C10, F2* | 6.80 *U1,Y1* | 4.50 *U1,Y1, R3* | | 6.30 *Y1* | 6.725 *Y1* | 6.60 *Y1* |
| WEST | Emeryville, Cal. | 5.40 *J5* | 5.40 *J5* | | | | | | | | | |
| | Fontana, Cal. | 5.35 *K1* | 5.35 *K1* | | 6.625 *K1* | | 7.50 *K1* | 5.20 *K1* | | 7.00 *K1* | 7.375 *K1* | |
| | Geneva, Utah | | | | | | | 4.50 *C7* | | | 6.725 *C7* | |
| | Kansas City, Mo. | 4.90 *S2* | 4.90 *S2* | | 5.825 *S2* | | 7.05 *S2* | | | | | 6.85 *S2* |
| | Los Angeles, Torrance, Cal. | 5.35 *B2,C7* | 5.35 *B2,C7* | 7.70 *R3* | 6.625 *B2* | | 7.50 *B2* | | | | 7.625 *B2* | 7.55 *B2* |
| | Minnequa, Colo. | 5.10 *C6* | 5.10 *C6* | | | | | 5.35 *C6* | | | | 6.85 *C6* |
| | Portland, Ore. | 5.40 *O2* | 5.40 *O2* | | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.35 *C7* 5.40 *B2,P9* | 5.35 *C7* 5.40 *B2,P9* | | | | 7.55 *B2* | | | | | 7.55 *C7* 7.55 *C6* |
| | Seattle, Wash. | 5.40 *B2,P12, N6* | 5.40 *B2,P12* | | | | 7.55 *B2* | 5.40 *B2* | | 7.20 *B2* | 7.625 *B2* | |
| SOUTH | Atlanta, Ga. | 5.15 *A8* | 5.15 *A8* | | | | | | | | | 6.80 *A8* |
| | Fairfield, Ala. City, Birmingham, Ala. | 4.65 *T2,R3* 5.15 *C16* | 4.65 *T2,R3* 5.15 *C16* | | | | 6.80 *T2* | 4.50 *T2,R3* | | | 6.725 *T2* | 6.60 *R3, T2* |
| | Houston, Ft. Worth, Lone Star, Tex. | 4.90 *S2* | 4.90 *S2* | | 5.825 *S2* | | 7.05 *S2* | 4.85 *L3* 4.60 *S2* | | 6.40 *S2* | 6.825 *S2* | 6.85 *S2* |

# Steel Prices *(Effective May 22, 1956)*

## Key to Steel Producers

With Principal Offices

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angell Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, O.
*A8* Atlantic Steel Co., Atlanta, Ga.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Pacific Coast Steel Corp., San Francisco
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.
*B6* Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C3* Central Iron & Steel Co., Harrisburg, Pa.
*C4* Claymont Products Dept., Claymont, Del.
*C5* Cold Metal Products Co., Youngstown, O.
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Pittsburgh, Pa.
*C11* Crucible Steel Co. of America, Pittsburgh
*C12* Cumberland Steel Co., Cumberland, Md
*C13* Cuyahoga Steel & Wire Co., Cleveland
*C14* Compressed Steel Shafting Co., Readville, Mass.
*C15* G. O. Carlson, Inc., Thorndale, Pa.
*C16* Connors Steel Div., Birmingham
*C17* Chester Blast Furnace, Inc., Chester, Pa.

*D1* Detroit Steel Corp., Detroit
*D2* Detroit Tube & Steel Div., Detroit
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.
*D5* Henry Disston & Sons, Inc., Philadelphia

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire Steel Co., Mansfield, O

*F1* Firth Sterling, Inc., McKeesport, Pa
*F2* Fitzsimmons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G1* Globe Iron Co., Jackson, O.
*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit
*G4* Greer Steel Co., Dover, O

*H1* Hanna Furnace Corp., Detroit

*I2* Ingersoll Steel Div., Chicago
*I3* Inland Steel Co., Chicago
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Joslyn Mfg. & Supply Co., Chicago
*J5* Judson Steel Corp., Emeryville, Calif.

*K1* Kaiser Steel Corp., Fontana, Cal.
*K2* Keystone Steel & Wire Co., Peoria
*K3* Koppers Co., Granite City, Ill.
*K4* Keystone Drawn Steel Co., Spring City, Pa.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O.
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid-States Steel & Wire Co., Crawfordsville, Ind
*M5* Monarch Steel Div., Hammond, Ind.
*M6* Mystic Iron Works, Everett, Mass.
*M7* Milton Steel Products Div., Milton, Pa.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Div., Pittsburgh
*N3* Niles Rolling Mill Div., Niles, O.
*N4* Northwestern Steel & Wire Co., Sterling, Ill.
*N5* Newport Steel Corp., Newport, Ky.
*N6* Northwest Steel Rolling Mills, Seattle
*N7* Newman Crosby Steel Co., Pawtucket, R. I.
*N8* Northeastern Steel Corp., Bridgeport, Conn.

*O1* Oliver Iron & Steel Co., Pittsburgh
*O2* Oregon Steel Mills, Portland

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Iron & Steel Co., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P5* Pittsburgh Screw & Bolt Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.
*P11* Production Steel Strip Corp., Detroit
*P12* Pacific Steel Rolling Mills, Seattle
*P13* Phoenix Mfg. Co., Joliet, Ill.

*R1* Reeves Steel & Mfg. Co., Dover, O.
*R2* Reliance Div., Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co., John A., Trenton, N. J.
*R5* Rotary Electric Steel Co., Detroit
*R6* Rodney Metals, Inc., New Bedford, Mass.
*R7* Rome Strip Steel Co., Rome, N. Y.

*S1* Sharon Steel Corp., Sharon, Pa.
*S2* Sheffield Steel Corp., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw and Steel Co., Fitchburg, Mass.
*S5* Sweet's Steel Co., Williamsport, Pa.
*S6* Standard Forging Corp., Chicago
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Corp., Carnegie, Pa.
*S10* Seneca Steel Service, Buffalo

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T6* Tremont Nail Co., Wareham, Mass.
*T7* Texas Steel Co., Fort Worth
*T8* Thompson Wire Co., Boston

*U1* United States Steel Corp., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.
*U3* Ulbrich Stainless Steels, Wallingford, Conn.
*U4* U. S. Pipe & Foundry Co., Birmingham

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago
*W8* Wisconsin Steel Co., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wyckoff Steel Co., Pittsburgh
*W11* Worcester Pressed Steel Co., Worcester, Mass.
*W12* Wallace Barnes Steel Div., Bristol, Conn.

*Y1* Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE AND TUBING

**Base discounts (pct) f.o.b. mills. Base price about $280 per net ton**

| | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½-3 In. | | 2 In. | | 2½ In. | | 3 In. | | 3½-4 In. | |
| STANDARD T. & C. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| Sparrows Pt. *B3* | 16.50 | 1.25 | 19.50 | 5.25 | 22.00 | 8.75 | 24.50 | 9.50 | 25.00 | 10.50 | 25.50 | 11.00 | 27.00 | 10.75 | | | | | | | | |
| Youngstown *R3* | 18.50 | 1.25 | 21.50 | 5.25 | 24.00 | 8.75 | 26.50 | 10.00 | 27.00 | 11.00 | 27.50 | 11.50 | 29.00 | 11.75 | | | | | | | | |
| Fontana *K1* | 6.00 | 13.25 | 9.00 | +9.25 | 11.50 | +5.75 | 14.00 | +4.00 | 14.50 | +3.00 | 15.00 | +2.50 | 16.50 | +1.75 | | | | | | | | |
| Pittsburgh *J3* | 18.50 | 1.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 4.00 | +11. | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| Alton, Ill. *L1* | 16.50 | 1.25 | 19.50 | 5.25 | 22.00 | 8.75 | 24.50 | 9.50 | 25.00 | 10.50 | 25.50 | 11.00 | 27.00 | 10.75 | | | | | | | | |
| Sharon *M3* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | | | | | | | | |
| Fairless *N2* | 16.50 | 1.25 | 19.50 | 5.25 | 22.00 | 8.75 | 24.50 | 9.50 | 25.00 | 10.50 | 25.50 | 11.00 | 27.00 | 10.75 | | | | | | | | |
| Pittsburgh *N1* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 4.00 | +11. | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| Wheeling *W5* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | | | | | | | | |
| Wheatland *W4* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | | | | | | | | |
| Youngstown *Y1* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 4.00 | +11. | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| Indiana Harbor *Y1* | 17.50 | 2.25 | 20.50 | 6.25 | 23.00 | 9.75 | 25.50 | 10.00 | 26.00 | 11.50 | 26.50 | 12.00 | 28.00 | 11.75 | | | | | | | | |
| Lorain *N2* | 18.50 | 3.25 | 21.50 | 7.25 | 24.00 | 10.75 | 26.50 | 11.50 | 27.00 | 12.50 | 27.50 | 13.00 | 29.00 | 12.75 | 4.00 | +11. | 10.50 | +6.25 | 13.00 | +3.75 | 14.50 | +2.25 |
| **EXTRA STRONG PLAIN ENDS** | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 21.00 | 7.25 | 25.00 | 11.25 | 27.00 | 14.75 | 27.50 | 13.50 | 28.00 | 14.50 | 28.50 | 15.00 | 29.00 | 13.75 | | | | | | | | |
| Youngstown *R3* | 23.00 | 7.25 | 27.00 | 11.25 | 29.00 | 14.75 | 29.50 | 14.00 | 30.00 | 15.00 | 30.50 | 15.50 | 31.00 | 14.75 | | | | | | | | |
| Fairless *N2* | 21.00 | 7.25 | 25.00 | 11.25 | 27.00 | 14.75 | 27.50 | 13.50 | 28.00 | 14.50 | 28.50 | 15.00 | 29.00 | 13.75 | | | | | | | | |
| Fontana *K1* | 10.50 | | 14.50 | | 16.50 | | 17.00 | | 17.50 | | 18.00 | | 18.50 | | | | | | | | | |
| Pittsburgh *J3* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 5.50 | +8.50 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |
| Alton, Ill. *L1* | 21.00 | 7.25 | 25.00 | 11.25 | 27.00 | 14.75 | 27.50 | 13.50 | 28.00 | 14.50 | 28.50 | 15.00 | 29.00 | 13.75 | | | | | | | | |
| Sharon *M3* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | | | | | | | | |
| Pittsburgh *N1* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 5.50 | +8.50 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |
| Wheeling *W5* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | | | | | | | | |
| Wheatland *W4* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | | | | | | | | |
| Youngstown *Y1* | 23.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 5.50 | +8.50 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |
| Indiana Harbor *Y1* | 22.00 | 8.25 | 26.00 | 12.25 | 28.00 | 15.75 | 28.50 | 14.50 | 29.00 | 15.50 | 29.50 | 16.00 | 30.00 | 14.75 | | | | | | | | |
| Lorain *N2* | 21.00 | 9.25 | 27.00 | 13.25 | 29.00 | 16.75 | 29.50 | 15.50 | 30.00 | 16.50 | 30.50 | 17.00 | 31.00 | 15.75 | 5.50 | +8.50 | 13.00 | +2.75 | 15.50 | +0.25 | 20.50 | 4.75 |

**Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.**

**Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.**

## TOOL STEEL

*F.o.b. mill*

| W | Cr | V | Mo | Co | per lb | SAE |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.60 | T-1 |
| 18 | 4 | 1 | — | 5 | 2.305 | T-4 |
| 18 | 4 | 2 | — | — | 1.765 | T-2 |
| 1.5 | 4 | 1.5 | 8 | — | .96 | M-1 |
| 6 | 4 | 2 | 6 | — | 1.35 | M-3 |
| 6 | 4 | 2 | 5 | — | 1.105 | M-2 |

| | |
|---|---|
| High-carbon chromium | .77 D-3, D-5 |
| Oil hardened manganese | .43 O-2 |
| Special carbon | .39 W-1 |
| Extra carbon | .33 W-1 |
| Regular carbon | .275 W-1 |

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb f.o.b.

| | Cladding | Plate (*A3, J2, L4*) 10 pct | 15 pct | 20 pct | Sheet (*I2*) 20 pct |
|---|---|---|---|---|---|
| Stainless Type | 304 | 30.30 | 33.15 | 36.05 | 32.50 |
| | 316 | 35.50 | 38.45 | 41.40 | 47.00 |
| | 321 | 32.00 | 34.85 | 37.75 | 37.25 |
| | 347 | 34.40 | 37.90 | 41.40 | 48.25 |
| | 405 | 25.80 | 29.60 | 33.35 | ..... |
| | 410, 430 | 25.30 | 29.10 | 32.85 | ..... |

CR Strip (S9) Copper, 10 pct, 2 sides, 42.75; 1 side, 33.75.

## ELECTRICAL SHEETS

| 22-Gage F.o.b. Mill Cents Per Lb | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) Semi-Processed | Fully Processed |
|---|---|---|---|
| Field | 8.40 | 8.60 | ..... |
| Armature | 9.35 | 9.60 | 10.10 |
| Elect. | 9.95 | 10.20 | 10.70 |
| Motor | 10.95 | 11.20 | 11.70 |
| Dynamo | 11.85 | 12.10 | 12.60 |
| Trans. 72 | 12.80 | 13.05 | 13.55 |
| Trans. 65 | 13.35 | Grain Oriented | |
| Trans. 58 | 13.85 | Trans. 80 ..... | 17.45 |
| Trans. 52 | 14.85 | Trans. 73 ..... | 17.95 |

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Manafield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

## LAKE SUPERIOR ORES

51.50% *Fe natural content, delivered lower Lake ports. Prices for* 1956 *season. Freight changes for seller's account.*

| | Gross Ton |
|---|---|
| Openhearth lump | $12.10 |
| Old range, bessemer | 11.25 |
| Old range, nonbessemer | 11.10 |
| Mesabi, bessemer | 11.00 |
| Mesabi, nonbessemer | 10.85 |
| High phosphorus | 10.85 |

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails Cal | Woven Wire Fence 9-15½ ga. Cal | "T" Fence Posts Cal | Single Loop Bale Ties Cal | Galv. Barbed and Twisted Barbless Wire Cal | Merch. Wire Ann'ld ¢/lb. | Merch. Wire Galv. ¢/lb. |
|---|---|---|---|---|---|---|---|
| Alabama City *R3* | 152 | 162 | .. | 173 | 175 | 7.40 | 7.80 |
| Aliquippa, Pa. *J3* | 152 | 162 | .. | .. | .. | 7.40 | 7.80 |
| Atlanta *A8* | 154 | 167 | .. | 177 | 180 | 7.60 | 8.125 |
| Bartonville *K2** | 154 | 168 | .. | 175 | 181 | 7.60 | 8.20 |
| Buffalo *W6* | .. | .. | .. | .. | .. | 7.50 | 7.90 |
| Chicago, Ill. *N4*** | 152 | 166 | .. | 175 | 179 | 7.50 | 8.10 |
| Cleveland *A6* | 157 | .. | .. | .. | .. | 7.50 | ..... |
| Cleveland *A5* | .. | .. | .. | .. | .. | 7.40 | ..... |
| Crawfordsville *M4** | 154 | 168 | .. | 177 | 181 | 7.60 | 8.20 |
| Donora, Pa. *A5* | 152 | 162 | .. | 175 | 175 | 7.50 | 7.90 |
| Duluth *A5* | 152 | 162 | .. | 175 | 175 | 7.50 | 7.90 |
| Fairfield, Ala. *T2* | 152 | 162 | .. | 175 | 175 | 7.50 | 7.90 |
| Galveston *D4* | 157 | .. | .. | .. | .. | .. | ..... |
| Houston *S2* | 157 | 170 | .. | .. | 180 | 7.65 | 8.05 |
| Johnstown, Pa. *B3** | 152 | 166 | .. | .. | 175 | 7.40 | 7.80 |
| Joliet, Ill. *A5* | 152 | 162 | .. | 175 | 175 | 7.50 | 8.10 |
| Kokomo, Ind. *C9* | 154 | 154 | .. | 177 | 177 | 7.60 | 8.00 |
| Los Angeles *B2** | .. | .. | .. | .. | .. | 8.35 | 8.925 |
| Kansas City *S2* | 157 | 167 | .. | 178 | 180 | 7.65 | 8.05 |
| Minnequa *C6* | 157 | 167 | 162 | 178 | 180 | 7.65 | 8.05 |
| Monessen *P6* | 152 | 162 | .. | .. | .. | 7.40 | 7.80 |
| Moline, Ill. *R3* | .. | 162 | 162 | .. | .. | .. | ..... |
| Pittsburg, Cal. *C7* | 171 | 185 | .. | 199 | 195 | 8.45 | 8.85 |
| Portsmouth *P7* | .. | .. | .. | .. | .. | 7.50 | ..... |
| Rankin, Pa. *A5* | 152 | 162 | .. | .. | 175 | 7.40 | 7.90 |
| So. Chicago *R3* | 152 | 162 | 157 | 173 | 175 | 7.40 | 7.80 |
| S. San Francisco *C6* | .. | .. | .. | 197 | 195 | 8.35 | 8.75 |
| Sparrows Pt. *B3** | 154 | .. | .. | 175 | 181 | 7.60 | 8.20 |
| Struthers, O. *Y1* | .. | .. | .. | .. | .. | 7.50 | 8.00 |
| Worcester *A5* | 158 | .. | .. | .. | .. | 7.70 | 8.20 |
| Williamsport, Pa. *S5* | .. | .. | 160 | .. | .. | .. | ..... |

Galvanized products computed with zinc at 5¢ per lb. Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

## WAREHOUSES

Metropolitan Price, dollars per 100 lb.

| Cities | City Delivery Charge‡ | Sheets Hot-Rolled | Cold-Rolled | Galvanized (10 gage) | Strip Hot-Rolled | Cold-Rolled | Plates | Shapes Standard Structural | Bars Hot-Rolled | Cold-Finished | Alloy Bars Hot-Rolled 4615 As rolled | Hot-Rolled 4140 Annealed | Cold-Drawn 4615 As rolled | Cold-Drawn 4140 Annealed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baltimore | $.10 | 7.31 | 8.32 | 8.37 | 7.65 | ..... | 7.63 | 7.93 | 7.61 | 8.62 | 14.38 | 13.44–13.96 | 16.38 | 16.29–16.49 |
| Birmingham | .15 | 6.80 | 7.93 | 8.85 | 7.06 | ..... | 6.99 | 7.28 | 7.08 | 9.35 | ..... | ..... | ..... | ..... |
| Boston | .10 | 8.22 | 9.17 | 10.42 | 8.31 | ..... | 8.51 | 8.37 | 8.37 | 9.83 | ..... | 13.66 | ..... | 16.76 |
| Buffalo | .15 | 7.35 | 8.40 | 10.16 | 7.50 | ..... | 7.80 | 7.75 | 7.50 | 8.05 | ..... | 13.50 | ..... | 16.55 |
| Chicago | .15 | 7.28 | 8.39 | 9.25 | 7.36 | ..... | 7.60 | 7.58 | 7.42 | 7.90 | ..... | 13.39 | ..... | 16.35 |
| Cincinnati | .15 | 7.40 | 8.38 | 9.10 | 7.60 | ..... | 7.89 | 8.05 | 7.66 | 8.30 | 13.59 | 13.29 | 16.44 | 16.39 |
| Cleveland | .15 | 7.28 | 8.39 | 9.10 | 7.46 | ..... | 7.77 | 7.91 | 7.48 | 8.15 | 13.41 | 13.11 | 16.26 | 16.21 |
| Denver | | 8.60 | 10.76 | 11.22 | 8.90 | ..... | 8.60 | 8.75 | 8.90 | 9.82 | ..... | ..... | ..... | 17.97 |
| Detroit | .15 | 7.47 | 8.58 | 9.53 | 7.49 | ..... | 7.88 | 8.05 | 7.70 | 8.19 | 13.70 | 13.40 | 16.55 | 16.50 |
| Houston | | 7.85 | 6.75 | 10.49 | 8.15 | ..... | 7.80 | 8.20 | 8.25 | 9.85–9.95 | 14.35 | 14.00 | 17.15 | 17.05 |
| Kansas City | .20 | 7.47 | 8.76 | 9.17 | 7.73 | ..... | 7.66 | 7.95 | 7.75 | 8.52 | 13.87 | 13.52 | 16.72 | 16.57 |
| Los Angeles | .10 | 8.25 | 10.10 | 11.10 | 8.60 | ..... | 8.85 | 8.40 | 8.25 | 11.00 | ..... | 14.45 | ..... | 18.00 |
| Memphis | .10 | 7.12 | 8.25 | ..... | 7.38 | ..... | 7.31 | 7.60 | 7.40 | 9.15 | ..... | ..... | ..... | ..... |
| Milwaukee | .15 | 7.37 | 8.48 | 9.34 | 7.45 | ..... | 7.69 | 7.75 | 7.51 | 8.09 | ..... | 13.39 | ..... | 16.44 |
| New Orleans | .15 | 7.20 | 8.35 | ..... | 7.45 | ..... | 7.40 | 7.70 | 7.50 | 9.55 | ..... | ..... | ..... | ..... |
| New York | .10 | 7.88 | 8.98 | 9.73 | 8.33 | ..... | 8.31 | 8.21 | 8.26 | 9.87 | ..... | 13.57 | ..... | 16.67 |
| Norfolk | .20 | 7.25 | ..... | ..... | 7.65 | ..... | 7.45 | 7.95 | 7.65 | 9.50 | ..... | ..... | ..... | ..... |
| Philadelphia | .10 | 7.44 | 8.54 | 9.51 | 8.09 | ..... | 7.82 | 7.85 | 7.83 | 8.62 | ..... | 13.35 | ..... | 16.45 |
| Pittsburgh | .15 | 7.28 | 8.39 | 9.55 | 7.46 | 9.00 | 7.60 | 7.58 | 7.42 | 8.00 | 13.35 | 13.05 | 16.20 | 16.15 |
| Portland | | 7.80–8.60 | 8.80–10.15 | 10.65 | 8.00 | 7.95 | 7.75 | 7.85–8.15 | 7.95 | 12.20 | ..... | 15.00 | ..... | 17.50 |
| Salt Lake City | .20 | ..... | 10.60 | ..... | 9.35 | ..... | ..... | 9.20 | 9.15 | ..... | ..... | ..... | ..... | ..... |
| San Francisco | .10 | 8.30 | 9.75 | 10.25 | 8.45 | ..... | 8.40 | 8.35 | 8.25 | 11.55 | ..... | 14.45 | ..... | 18.00 |
| Seattle | .00 | 8.75 | 10.50 | 10.90 | 8.90 | ..... | 8.50 | 8.50 | 8.60 | 12.25 | ..... | 14.65 | ..... | ..... |
| St. Louis | .15 | 7.57 | 8.68 | 9.54 | 7.65 | ..... | 7.89 | 7.98 | 7.71 | 8.44 | ..... | 13.59 | ..... | 16.64 |
| St. Paul | .25 | 7.94 | 8.59–9.14 | 9.89 | 7.72 | ..... | 7.65 | 7.94 | 7.74 | 8.51 | ..... | 13.51 | ..... | 16.31 |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

*Plus analysis charge. ‡Deduct for country delivery.

## C-R SPRING STEEL

| Cents Per Lb F.o.b. Mill | CARBON CONTENT 0.26–0.40 | 0.41–0.60 | 0.61–0.80 | 0.81–1.05 | 1.06–1.35 |
|---|---|---|---|---|---|
| Bristol, Conn. *W12* | ..... | ..... | 10.90 | 13.05 | 15.75 |
| Buffalo, N. Y. *R7* | 7.00 | 8.95 | 10.50 | 12.65 | 15.35 |
| Carnegie, Pa. *S9* | ..... | 9.05 | 10.60 | 12.75 | 15.35 |
| Cleveland *A5* | 7.10 | 9.05 | 10.60 | 12.75 | 15.45 |
| Detroit *D1* | 7.20 | 9.15 | 10.70 | 12.85 | ..... |
| Detroit *D2* | 7.20 | 9.15 | 10.70 | ..... | ..... |
| Harrison, N. J. *C11* | ..... | ..... | 10.90 | 13.05 | 15.75 |
| Indianapolis *C5* | 7.15 | 9.10 | 10.50 | 12.65 | 15.35 |
| New Castle, Pa. *B4* | 7.00 | 8.95 | 10.50 | 12.65 | ..... |
| New Haven, Conn. *D1* | 7.55 | 9.35 | 10.90 | 13.05 | ..... |
| Pawtucket, R. I. *N7* | 7.65 | 9.35 | 10.90 | 13.05 | 15.75 |
| Pittsburgh *S7* | 7.10 | 9.05 | 10.60 | 12.75 | 15.45 |
| Riverdale, Ill. *A1* | 7.20 | 9.05 | 10.60 | 12.75 | 15.45 |
| Sharon, Pa. *S1* | 7.10 | 9.05 | 10.60 | 12.75 | 15.45 |
| Trenton *R4* | ..... | ..... | ..... | ..... | ..... |
| Wallingford *W1* | 7.55 | 9.35 | 10.90 | 13.05 | 15.75 |
| Warren, Ohio *T4* | 7.00 | 8.95 | 10.50 | 12.65 | 15.35 |
| Weirton, W. Va. *W3* | 7.10 | 8.95 | 10.50 | ..... | ..... |
| Worcester, Mass. *A5* | 7.65 | 9.35 | 10.90 | 13.05 | 15.75 |
| Youngstown *C5* | 7.00 | 8.95 | 10.50 | 12.65 | 15.35 |

## BOILER TUBES

| $ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill | Size OD-In. | B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. | Elec. Weld C.D. |
|---|---|---|---|---|---|---|
| Babcock & Wilcox | 2 | 13 | 32.09 | 37.37 | 29.93 | ..... |
| | 2½ | 12 | 43.22 | 50.31 | 40.31 | ..... |
| | 3 | 12 | 49.90 | 58.10 | 46.55 | ..... |
| | 3½ | 11 | 58.26 | 67.83 | 54.34 | ..... |
| | 4 | 10 | 77.36 | 90.07 | 72.17 | ..... |
| National Tube | 2 | 13 | 32.09 | 37.37 | 29.93 | ..... |
| | 2½ | 12 | 43.22 | 50.31 | 40.31 | ..... |
| | 3 | 12 | 49.90 | 58.10 | 46.55 | ..... |
| | 3½ | 11 | 58.26 | 67.83 | 54.34 | ..... |
| | 4 | 10 | 77.36 | 90.07 | 72.17 | ..... |
| Pittsburgh Steel | 2 | 13 | 32.09 | 37.37 | ..... | ..... |
| | 2½ | 12 | 43.22 | 50.31 | ..... | ..... |
| | 3 | 12 | 49.90 | 58.10 | ..... | ..... |
| | 3½ | 11 | 58.26 | 67.83 | ..... | ..... |
| | 4 | 10 | 77.36 | 90.07 | ..... | ..... |

*(Effective May 22, 1956)*

## RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Screw Spikes | Tie Plates | Track Bolts Untreated |
|---|---|---|---|---|---|---|---|
| Bessemer *UI* | 4.725 | 5.65 | 5.825 | .... | .... | .... | .... |
| So. Chicago *R3* | .... | .... | .... | 8.05 | .... | .... | .... |
| Ensley *T2* | 4.725 | 5.65 | .... | .... | .... | .... | .... |
| Fairfield *T2* | .... | 5.65 | .... | 8.05 | .... | 5.625 | .... |
| Gary *UI* | 4.725 | 5.65 | .... | .... | .... | 5.625 | .... |
| Ind. Harbor *I3* | 4.725 | .... | 5.825 | 7.90 | .... | 5.625 | .... |
| Ind. Harbor *Y1* | .... | .... | .... | 8.05 | .... | .... | .... |
| Johnstown *B3* | .... | 5.65 | .... | .... | .... | .... | .... |
| Joliet *UI* | .... | .... | 5.825 | .... | .... | .... | .... |
| Kansas City *S2* | .... | .... | .... | 7.90 | .... | .... | .... |
| Lackawanna *B3* | 4.725 | 5.65 | 5.825 | .... | .... | 5.625 | .... |
| Lebanon *B3* | .... | .... | .... | .... | .... | .... | 12.15 |
| Minnequa *Ch* | 4.725 | 6.15 | 5.825 | 7.90 | .... | 5.625 | 12.15 |
| Pittsburgh *O1* | .... | .... | .... | .... | 11.90 | .... | 12.15 |
| Pittsburgh *P5* | .... | .... | .... | .... | .... | .... | 12.15 |
| Pittsburgh *J3* | .... | .... | .... | 8.05 | .... | .... | .... |
| Seattle *B2* | .... | .... | .... | 8.40 | .... | 5.775 | 12.65 |
| Steelton *B3* | 4.725 | .... | 5.825 | .... | .... | 5.625 | .... |
| Struthers *Y1* | .... | .... | .... | 8.05 | .... | .... | .... |
| Torrance *C7* | .... | .... | .... | .... | .... | 5.775 | .... |
| Williamsport *S5* | .... | 5.65 | .... | .... | .... | .... | .... |
| Youngstown *R3* | .... | .... | .... | 8.05 | .... | .... | .... |

## COKE

| | |
|---|---|
| Furnace, beehive (f.o.b. oven) Connellsville, Pa. | Net-Ton $14.50 |
| Foundry, beehive (f.o.b. oven) Connellsville, Pa. | $17.00 to $18.00 |
| Foundry, oven coke | |
| Buffalo, del'd | $28.75 |
| Chicago, f.o.b. | 27.00 |
| Detroit, f.o.b. | 27.50 |
| New England, del'd | 28.55 |
| Seaboard, N. J., f.o.b. | 26.75 |
| Philadelphia, f.o.b. | 26.50 |
| Swedeland, Pa., f.o.b. | 26.50 |
| Painesville, Ohio, f.o.b. | 27.50 |
| Erie, Pa., f.o.b. | 27.50 |
| Cleveland, del'd | 29.43 |
| Cincinnati, del'd | 28.59 |
| St. Paul, f.o.b. | 26.50 |
| St. Louis, f.o.b. | 28.50 |
| Birmingham, f.o.b. | 25.65 |
| Lone Star, Tex., f.o.b. | 19.50 |

## ELECTRODES

*Cents per lb f.o.b. plant, threaded, with nipples, unboxed.*

| GRAPHITE Diam. (In.) | Length (In.) | Price | CARBON* Diam. (In.) | Length (In.) | Price |
|---|---|---|---|---|---|
| 24 | 84 | 23.00 | 40 | 100,110 | 9.90 |
| 20 | 72 | 22.25 | 35 | 110 | 9.95 |
| 18 to 18 | 72 | 22.50 | 30 | 110 | 10.05 |
| 14 | 72 | 23.00 | 24 | 72 to 84 | 10.30 |
| 12 | 72 | 23.50 | 20 | 90 | 10.10 |
| 10 | 60 | 24.25 | 17 | 72 | 10.35 |
| 7 | 60 | 24.50 | 14 | 72 | 10.85 |
| 5 | 60 | 27.25 | 12 | 60 | 11.75 |
| 4 | 40 | 30.25 | 10 | 60 | 11.80 |
| 3 | 40 | 32.00 | 8 | 60 | 12.10 |
| 2½ | 30 | 33.75 | | | |
| 2 | 24 | 52.50 | | | |

* Prices shown cover carbon nipples.

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, frt allowed in quantity)*

| | |
|---|---|
| Copper | |
| Cast elliptical, 18 in. or longer, 5000 lb lots | 61.92 |
| Electrodeposited | 57.75 |
| Brass, 80-20, ball anodes, 2000 lb or more | 60.00 |
| Zinc, ball anodes, 2000 lb lots (for elliptical add 2¢ per lb) | 21.75 |
| Nickel, 99 pct plus, rolled carbon (rolled depolarized add 3¢ per lb) | 90.05 |
| Cadmium | $1.70 |
| Tin, ball anodes and elliptical | $1.06 to $1.10 |

### Chemicals

*(Cents per lb, f.o.b. shipping point)*

| | |
|---|---|
| Copper cyanide, 100 lb drum | 83.50 |
| Copper sulphate, 5 or more 100 lb bags, per cwt | 18.15 |
| Nickel salts, single, 4-100 lb bags | 33.25 |
| Nickel chloride, freight allowed, 800 lbs | 43.50 |
| Sodium cyanide, domestic, fob N. Y. 1 to 4 200 lb drums (Philadelphia price 22.60) | 22.35 |
| Zinc cyanide, 100 to 900 lb | 55.55 |
| Potassium cyanide, 100 lb drum N. Y. | 48.00 |
| Chromic acid, flake type, 1 to 20 100 lb drums | 30.25 |

## BOLTS, NUTS, RIVETS, SCREWS

*(Base discount, f.o.b. mill)*

### Machine and Carriage Bolt

| | Discounts Full case | Full case 20,000 lb. Quantity or more |
|---|---|---|
| ⅛ in. & smaller x 6 in. & shorter | 61 | 63 |
| Larger than ⅛ in. diam. and all diam. longer than 6 in. | 55 | 57 |
| Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter | 61 | 63 |
| Lag, all diam. x 6 in. & shorter | 61 | 63 |
| Lag, all diam. longer than 6 in. | 55 | 57 |
| Plow bolts | 61 | 63 |

### Nuts, Hex, HP, reg. & hvy.

| | | |
|---|---|---|
| ¾" or smaller | 64 | 66 |
| ⅞" to 1⅛" inclusive | 63 | 65 |
| 1¼" to 1½" inclusive | 65 | 67 |
| 1⅝" and larger | 61 | 63 |

### C.P. Hex regular & hvy.

| | | |
|---|---|---|
| ¾" or smaller | 64 | 66 |
| ⅞" and larger | 61 | 63 |

### Hot Galv. Nuts (all types)

| | | |
|---|---|---|
| 1½" or smaller | 44 | 47 |

### Finished, Semi-finished, Hex Nuts

| | | |
|---|---|---|
| ¾" and smaller | 66 | 66 |
| ⅞" and larger | 63 | 63 |

Add 25% for less than case or keg quantity.

### Rivets

| | Base per 100 lb |
|---|---|
| ⅛ in. and larger | $9.95 |
| | Pct Off List |
| 7/16 in. and smaller | 33 |

### Cap Screws

| | Discount H.C. Heat |
|---|---|
| Bright Treated | |
| New std. hex head, packaged ¼" thru ½" diam. x 6" and shorter | 34 20 |
| 9/16" and ⅝" x 6" and smaller and shorter | 31 16 |
| ¾", ⅞", 1" x 6" and shorter | 9 +11 |
| New std. hex head, bulk* ¼" thru ½" diam. x 6" and shorter | 49 41 |
| 9/16" and ⅝" diam. x 6" and shorter | 43 39 |
| ¾", ⅞", 1" x 6" and shorter | 31 20 |

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

### Machine Screws & Stove Bolts

| | | Discount Mach. Screws | Stove Bolts |
|---|---|---|---|
| Packaged, package list | | 27 | 38 |
| Bulk, bulk list | | | |
| | Quantity | | |
| ¼-in. diam. & under | 25,000-200,000 | 20 | 61 |
| 5/16-in. diam. & larger | 15,000-100,000 | 20 | 61 |
| All diam. over 3 in. long | 5,000-100,000 | — | 61 |

### Machine Screw & Stove Bolt Nuts

| | | Discount Hex | Square |
|---|---|---|---|
| Packaged, package list | | 24 | 27 |
| Bulk, bulk list | | | |
| | Quantity | | |
| ¾-in. diam. & smaller | 25,000-200,000 | 18 | 20 |

## CAST IRON WATER PIPE INDEX

| | |
|---|---|
| Birmingham | 111.3 |
| New York | 123.7 |
| Chicago | 125.7 |
| San Francisco-L. A. | 134.8 |

*Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.*

## REFRACTORIES

| Fire Clay Brick | Carloads per 1000 |
|---|---|
| First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) | $122.00 |
| No. 1 Ohio | ..... |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 114.00 |
| No. 2 Ohio | 98.00 |
| Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) | 18.00 |

### Silica Brick

| | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. | $128.00 |
| Childs, Hays, Pa. | 138.00 |
| Chicago District | 138.00 |
| Western Utah | 144.00 |
| California | 151.00 |
| Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O. | 145.00 |
| Curtner, Calif. | 163.00 |
| Silica cement, net ton, bulk, Eastern (except Hays, Pa.) | 21.00 |
| Silica cement, net ton, bulk, Hays, Pa. | 24.00 |
| Silica cement, net ton, bulk, Chicago District, Ensley, Ala. | 22.00 |
| Silica cement, net ton, bulk, Utah and Calif. | 32.00 |

| Chrome Brick | Per net ton |
|---|---|
| Standard chemically bonded, Balt. | $91.00 |
| Standards chemically bonded, Curtner, Calif. | 101.25 |
| Burned, Balt. | 85.00 |

### Magnesite Brick

| | |
|---|---|
| Standard Baltimore | $114.00 |
| Chemically bonded, Baltimore | 102.00 |

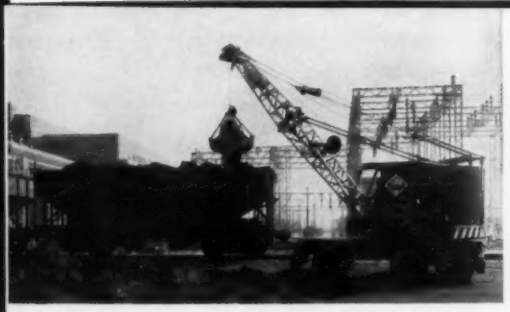
| Grain Magnesite | St. ¾-in. grains |
|---|---|
| Domestic, f.o.b. Baltimore in bulk fines removed | $64.00 |
| Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk | 40.00 |
| in sacks | 46.00 |

| Dead Burned Dolomite | Per net ton |
|---|---|
| F.o.b. bulk, producing points in: Pa., W. Va., Ohio | $15.00 |
| Midwest | 15.50 |
| Missouri Valley | 14.00 |

## METAL POWDERS

*Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.*

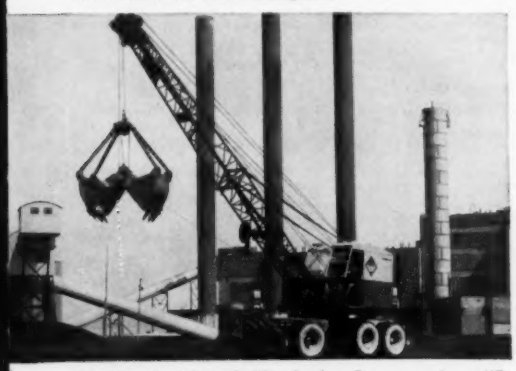
| | |
|---|---|
| Swedish sponge iron c.l.f. New York, ocean bags | 9.50¢ |
| Canadian sponge iron, Del'd in East, carloads | 9.5¢ |
| Domestic sponge iron, 98+% Fe, carload lots | 9.5¢ |
| Electrolytic iron, annealed, imported 99.5+% Fe | 27.5¢ |
| domestic 99.5+% Fe | 36.5¢ |
| Electrolytic iron, unannealed minus 325 mesh, 99+% Fe | 57.0¢ |
| Electrolytic iron melting stock, 99.84% pure | 22.0¢ |
| Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe | 86.0¢ to $1.58 |
| Aluminum freight allowed | 38.00¢ |
| Brass, 10 ton lots | 37.50¢ to 50.00¢ |
| Copper, electrolytic | 61.50¢ |
| Copper, reduced | 61.50¢ |
| Cadmium, 100-199 lb. 95¢ plus metal value | |
| Chromium, electrolytic 99.85% min. Fe .03 max. Del'd | $5.00 |
| Lead | 7.50¢ plus metal value |
| Manganese | 70.0¢ |
| Molybdenum, 99% | $3.00 to $3.25 |
| Nickel, unannealed | $1.00 |
| Nickel, annealed | $1.06 |
| Nickel, spherical, unannealed, #80 | $1.13 |
| Silicon | 43.50¢ |
| Solder powder | 7.0¢ to 9.0¢ plus met. value |
| Stainless steel, 302 | 99.0¢ |
| Stainless steel, 316 | $1.32 |
| Tin | 14.00¢ plus metal value |
| Tungsten, 99% (65 mesh) | $4.50 |
| Zinc, 10 ton lots | 18.75¢ to 32.50¢ |



With a fast switch from clamshell to hook on the front end, Philadelphia Electric Co.'s Limas handle anything from the loading of slag or ashes to lifting bushings from transformers during repair work. Their three Limas give constant peak performance with maximum flexibility, low maintenance and high availability.

Jones and Laughlin Steel Corporation's Cleveland Works reports, "We really benefit from our Lima's versatility. For several years it loaded limestone at blast furnaces—24 hours a day, 7 days a week without breakdown. Since then, it's been used—with hook or magnet—to load or unload rails, scrap, castings, coil steel and other receivable materials in all parts of the plant. It works in areas where other equipment can't. Performance has been excellent."

In The Midvale Co.'s Philadelphia yard their Lima handles scrap up to 20 tons. They state, "Our Lima does the work of two locomotive cranes. Its faster operation and greater work output has saved us many hours on the job with low maintenance and fuel consumption."



The Cleveland Electric Illuminating Company relates, "By easily interchanging clamshell and hook on the boom, we've used our Lima for general construction work during building of the Eastlake plant . . . coal handling . . . stock materials handling . . . laying tracks and ties for rail spurs . . . moving steel used in high wire work . . . and many other jobs. For four years, it's given us exceptional performance with no major downtime."

## Versatile, fast-working LIMAS solved yard materials handling problems for these four users

These and a host of other users across the country are finding wagon and truck mounted Limas best-suited for a wide variety of materials handling assignments. In yard handling operations these rugged, highly mobile machines move anywhere at top speed, get jobs done quickly, dependably and economically. Easily interchangeable front end attachments—shovel, dragline, clamshell, pullshovel or pile driver—give Limas outstanding flexibility for tackling the toughest job requirements under all operating conditions.

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# Ferroalloy Prices

*(Effective May 22, 1956)*

### Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

| | | | |
|---|---|---|---|
| 0.02% C | 38.50 | 0.20% C | 35.50 |
| 0.03% C | 38.00 | 0.50% C | 35.25 |
| 0.06% C | 36.50 | 1.00% C | 34.00 |
| 0.10% C | 36.00 | 1.50% C | 33.85 |
| 0.15% C | 35.75 | 2.00% C | 33.75 |

4.00-4.50% C, 67.70% Cr, 1-2% Si... 26.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si ... 25.00
0.025% C (Simplex) ... 31.75
0.10% C, 50-52% Cr, 2% max Si ... 33.75
8.50% max. C, 50-55% Cr, 3-6% Si... 22.50
8.50% C, 50-55% Cr, 3% max Si.... 22.50

### High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

### Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

| | |
|---|---|
| 0.10% max. C | $1.27 |
| 0.50% max. C | 1.27 |
| 9 to 11% C, 33-91% Cr, 0.75% Fe.. | 1.36 |

### Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅜" thick) delivered packed. 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

| | |
|---|---|
| Carloads | 1.25 |
| Ton lots | 1.27 |
| Less ton lots | 1.29 |

### Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

| | |
|---|---|
| Carloads | 41.35 |
| Ton lots | 46.15 |
| Less ton lots | 48.65 |

### Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.

| | |
|---|---|
| Carloads | 22.95 |
| Ton lots | 25.25 |
| Less ton lots | 26.75 |

### Calcium-Maganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

| | |
|---|---|
| Carloads | 23.05 |
| Ton lots | 24.95 |
| Less ton lots | 25.95 |

### SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

| | |
|---|---|
| Ton lots | 19.65 |
| Less ton lots | 20.90 |

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

| | |
|---|---|
| Carload lots | 17.20 |
| Ton lots | 18.70 |
| Less ton lots | 19.95 |

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

| | |
|---|---|
| Carload packed | 18.50 |
| Ton lots to carload packed | 19.65 |
| Less ton lots | 20.90 |

### Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

| Producing Point | Cents per-lb |
|---|---|
| Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. | 10.75 |
| Johnstown, Pa. | 10.75 |
| Sheridan, Pa. | 10.75 |
| Philo, Ohio | 10.75 |
| S. Duquesne | 10.75 |

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

| | |
|---|---|
| Carloads, bulk | 13.00 |
| Ton lots packed | 15.20 |

### Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

| Manganese | Silicon | |
|---|---|---|
| 16 to 19% | 3% max. | $92.00 |
| 19 to 21% | 3% max. | 94.00 |
| 21 to 23% | 3% max. | 96.50 |

### Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

| | |
|---|---|
| Carload, packed | 45.75 |
| Ton lots | 47.25 |

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

| | |
|---|---|
| Carloads | 31.5 |
| Ton lots | 33.5 |
| 250 to 1999 lb | 35.5 |
| Premium for hydrogen-removed metal | 0.75 |

### Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn.. 22.85

### Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.07% max. C, 0.06% P, 90% Mn | 34.00 | 36.55 | 37.75 |
| 0.07% max. C | 31.95 | 34.50 | 35.70 |
| 0.10% max. C | 31.20 | 33.75 | 34.95 |
| 0.15% max. C | 30.45 | 33.00 | 34.20 |
| 0.30% max. C | 28.95 | 31.50 | 32.70 |
| 0.50% max. C | 28.45 | 31.00 | 32.20 |
| 0.75% max. C, 80.85% Mn, 5.0-7.0% Si | 25.45 | 28.00 | 29.20 |

### Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

| | |
|---|---|
| Carload bulk | 12.00 |
| Ton lots | 13.45 |
| Briquet contract basis carloads, bulk, delivered, per lb of briquet | 13.55 |
| Ton lots, packed | 15.75 |

### Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

| | Ton lots | Carloads |
|---|---|---|
| 96.50% Si, 2% Fe | 22.75 | 21.45 |
| 98% Si, 1% Fe | 23.25 | 21.95 |

### Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

| | |
|---|---|
| Carloads, bulk | 7.15 |
| Ton lots, packed | 9.75 |

### Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

| | | | |
|---|---|---|---|
| 50% Si | 12.75 | 75% Si | 15.40 |
| 65% Si | 14.50 | 85% Si | 17.10 |
| | | 90% Si | 18.50 |

### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots | $2.05 | $2.95 | $3.75 |
| Less ton lots | 2.40 | 3.30 | 4.55 |

### Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

| | |
|---|---|
| Openhearth | 3.10 |
| Crucible | 3.20 |
| High speed steel (Primos) | 3.30 |

**Alsifer,** 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

| | |
|---|---|
| Carloads | 10.65¢ |
| Ton lots | 11.80¢ |

**Calcium molybdate,** 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ... $1.34

**Ferrocolumbium,** 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

| | |
|---|---|
| Ton lots | $6.90 |
| Less ton lots | 6.95 |

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.65

**Ferromolybdenum,** 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton ... $90.00
10 tons to less carload ... $110.00

**Ferrotitanium,** 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.35

**Ferrotitanium** 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.50
Less ton lots ... $1.55

**Ferrotitanium,** 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton... $177.00

**Ferrotungsten,** ¼ x down, packed, per pound contained W, ton lots, delivered... $3.45

**Molybdic oxide,** briquets, per lb contained Mo, f.o.b. Langeloth, Pa. ... $1.32
bags, f.o.b. Washington, Pa., Langeloth, Pa. ... $1.30

**Simanal,** 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

| | |
|---|---|
| Carload, bulk lump | 17.50¢ |
| Ton lots, packed lump | 19.50¢ |
| Less ton lots | 20.00¢ |

**Vanadium oxide,** 86-89% $V_2O_5$ contract basis, per pound contained $V_2O_5$ ... $1.33

**Zirconium** contract basis, per lb of alloy
35-40% f.o.b freight allowed, carloads, packed ... 26.25¢
12-15%, del'd lump, bulk-carloads ... 8.50¢

### Boron Agents

**Borosil,** contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B 3.14%, Si 40-45%, per lb contained 2.... $5.25

**Bortam,** f.o.b. Niagara Falls
Ton lots, per pound... 45¢
Less ton lots, per pound.... 50¢

**Corbortam,** Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound... 10.00¢

**Ferroboron,** 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20
F.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B... .85
14 to 19% B... 1.20
19% min. B... 1.50

**Grainal,** f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over
No. 1 ... $1.05
No. 79 ... 50¢

**Manganese - Boron,** 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
D, del'd.
Ton lots ... $1.48
Less ton lots... 1.57

**Nickel-Boron,** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots... $2.05

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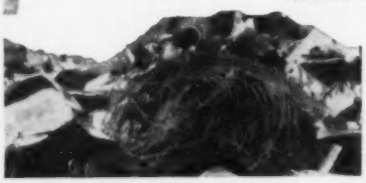

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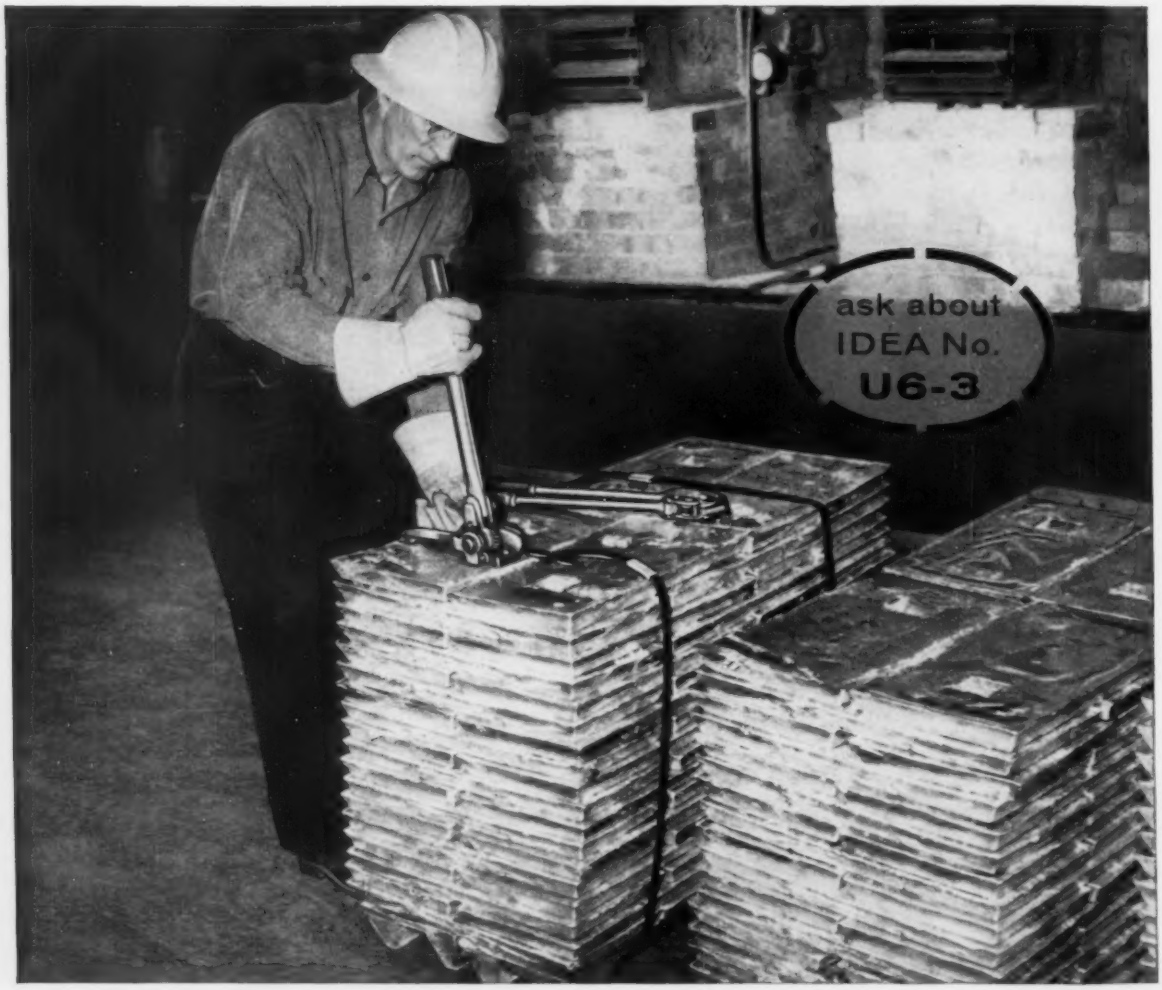


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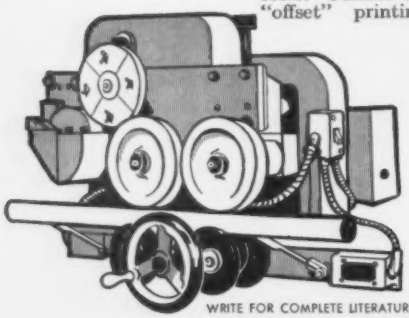

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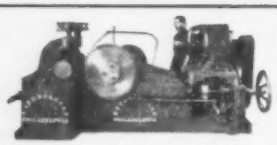

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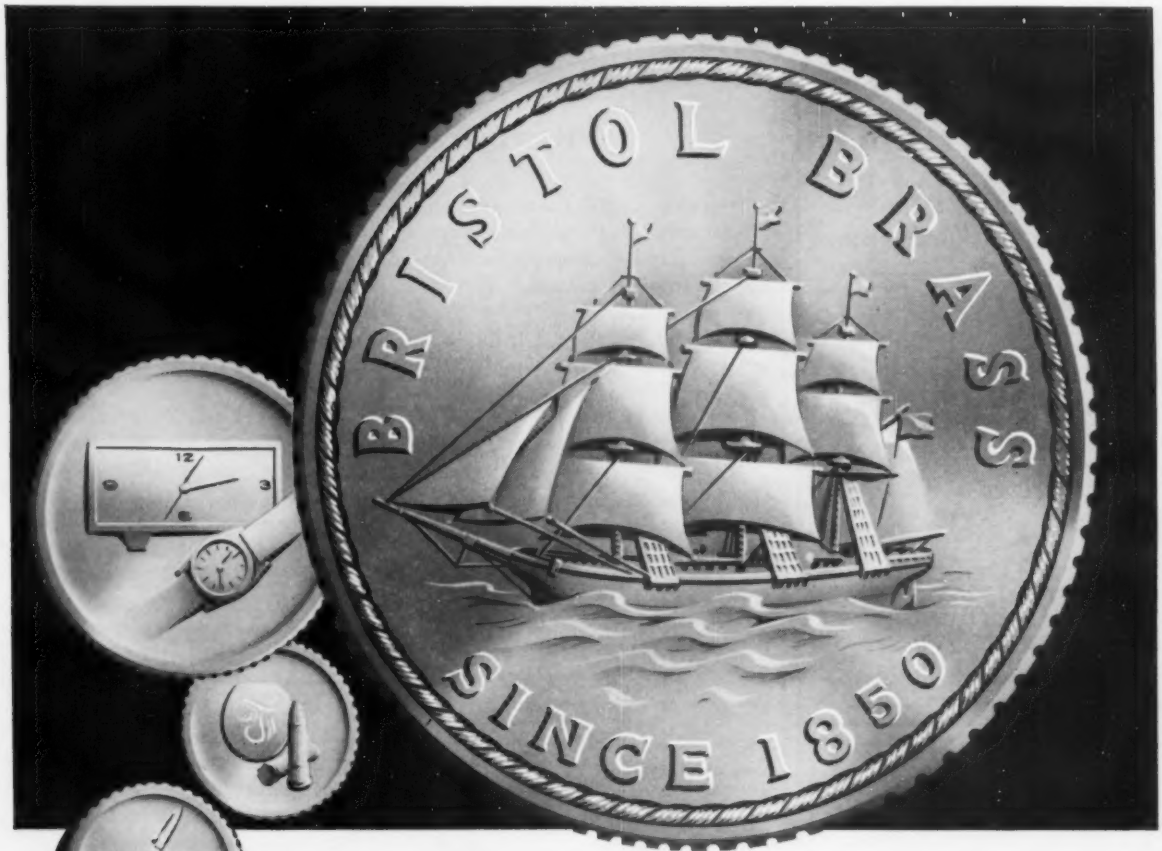


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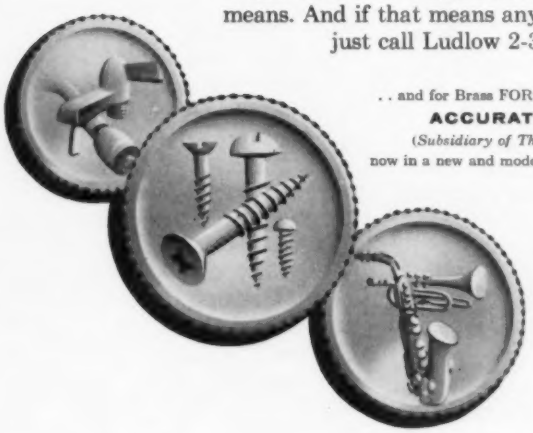

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One dealer reports 2 to 3 inquiries a day for bar mills. His big problem is to get the mills, which nobody is turning loose at this time.

Demand for nonferrous flat rolling equipment has been steady, and there has been an upswing in the calls for small rolling mills by specialty producers working on atomic projects.

In the export field, Spain and South America have been particularly active. One dealer is in the process of shipping a two-high, hot-strip reversing mill to Spain, has a three-high plate mill going to South America.

**Cranes Wanted** . . . The market for used cranes is marked by heavy inquiries and somewhat looser supply. One dealer reports picking up 50-ton and 60-ton cranes for relatively low prices at a recent sale. But owners refused to let another model go at the prices bid. A 120-ton crane that would cost $100,000 new went for $20,000 at another sale.

The trouble is that most of the cranes being offered are 25 to 30 years old, and most inquiries specify models no more than 10 years old. Customers want modern equipment with roller bearings and welded frames, which means the models can't go back further than 1945.

**Major Moving** . . . Another crane headache is the expense of moving large models. One dealer was interested in a 110-ton ladle crane with a 50 ft span. He was told that the cost of taking the crane down would be $18,000. He had planned to spend no more than $25,000.

General used machinery, both production and toolroom, is moving at a brisk rate, according to one dealer. He said inquiries exceeded offerings by about two-to-one. Lathes are very strong. Milling machines, radial drills and shapers are all hard to get.

**Old Timers** . . . As evidence of the strength of the market, customers are taking older models, going back as far as 1935. And dealers are finding buyers in all sections of the country. Three shipments to West Coast firms have been made in the past week by a Pittsburgh dealer, one to Oregon, the other two to California.

Surge is attributed to two factors: (1) deliveries of new equipment are stretching out, (2) business in general is still good. Speaking of delivery, a dealer said that present situation on new equipment had taken the emphasis off price in used machinery selling. Used equipment man who once had to sell on price, is now making his big point delivery.

**No Effect** . . . There has been no evidence that the automotive slump is affecting the business or shops in the Pittsburgh area. One dealer, who serves the local district, said inquiries are holding up, and heavy equipment—even older models—are moving well.

Dealers are paying stiff prices to get what machines customers want. Most are operating with depleted inventories, and the competition for the few newer models is hot and costly.

**Not Shocking** . . . Electrical equipment is moving well. Steel mills, rubber plants and other basic producers are calling for large motor generators and gear reduction units at an unusually high rate. A dealer in equipment said rate of inquiry indicates that producers are in the middle of heavy replacement programs.

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**BALER**
Galland Henning Model 100 TC Baler, Box 51" x 37" x 85", Bale Size 350 to 500 lbs.

**BENDING ROLLS**
6' x ¼" Kling Pyramid Type
6' x ¼" Niles Initial Type
12' x ⅜" Cleveland Pyramid Type
16' x ⅜" Niles Pyramid Type
27' x 1" Southwark Pyramid Type

**BRAKE—PRESS TYPE**
12' x ⅜" Dreis & Krump
12' x ½" Dreis & Krump, Motor Driven

**BRAKES—PRESS TYPE**
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#5 Williams & White, 20" Stroke, 11½" x 63" Face of Crosshead
#27 Williams & White, 22" Stroke 16" x 80" Face of Crosshead

**CRANES—OVERHEAD ELECTRIC TRAVELING**

| | | |
|---|---|---|
| 5 ton P&H | 29' Span | 230 Volt D.C. |
| 5 ton Shepard Niles | 48' Span | 250 Volt D.C. |
| 5 ton Shepard Niles | 55' Span | 220 Volt D.C. |
| 5 ton P&H | 80' Span | 220/3/60 A.C. |
| 5 ton P&H | 80' Span | 500/3/60 A.C. |
| 5 ton Cleveland | 96' Span | 230 Volt D.C. |
| 10 ton Cyclops | 40' Span | 220/440 A.C. |
| 10 ton P&H | 77' Span | 230 Volt D.C. |
| 10 ton Milwaukee | 80' Span | 230 Volt D.C. |
| 10 ton Shepard Niles | 87' Span | 250 Volt D.C. |
| 10 ton P&H | 96' Span | 220 Volt D.C. |
| 15 ton Chesapeake | 87' Span | 250 Volt D.C. |
| 25 ton Niles | 87' Span | 250 Volt D.C. |
| 50 ton Hand Opr. | 100' Span | |
| 120 ton Whiting | 80' Span | 220/3/60 A.C. |

**CUT OFF MACHINES**
Yoder AD-2 Cut-off, Max. Capacity ¾" O.D.
Yoder Type L Flying Cut-Off, Cap'y. ¾" to 3" Tubing

**FORGING MACHINE**
1" to 5" Acme, Ajax, National

**FURNACE**
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60" United 17 Rolls 3¾" Dia.
72" McKay 17 Rolls 4¼" Dia.
84" McKay Type E, 17 Rolls 5⅛" Dia.

**MULTI SLIDE MACHINE**
No. 35 U. S. Multi Slide Machine with Edgewise Stock Straightener

**PRESS—GAP FRAME**
125 ton Beatty Inclined Open Back Gap Press, Stroke 1⅛" Bed Area 28⅞ x 16⅞" (New)

**PRESSES—HYDRAULIC**
530 ton Baldwin Southwark 12" stroke 48" x 25" Between Columns
1500 ton 4-Col., 24" Stroke, 40" Bet. Columns
1257 ton Baldwin Southwark Forging Press, 30" Stroke Main Ram, 54" x 41" Bet. Columns
4500 ton B-L-H Hydr. Forging Press

**PRESSES—STRAIGHT SIDE**
60D-84 Cleveland Double Crank 14" Stroke Bed Area 46" x 84"
Clearing Model TF41500-200 Triple Acting Strokes 40, 32, 14", Bed Area 100" x 200"

**PUNCH & SHEAR COMBINATIONS**
Style EF Cleveland 36" Throat, Punch 1¼" thru 1" Style W Cleveland 60" Throat, 312 Ton

**ROLLING MILLS**
10" x 16" Single Stand, Two High
12" x 16" Phila., Single Stand, Two High
12" x 20" Standard Single Stand, Two High
15" x 28" Farrel Single Stand, Two High
15" x 30" G & M Single Stand, Two High
16" x 24" Farrel Two Stand, Two High
22" x 12" x 40" Lewis 3-High Sheet Mill
12" Three High Bar Mill
26" x 54" United Single Stand, Two High
8" Torrington Ring Type Reversing Mill For cold reducing 7" wide strip

**SHEAR—BAR**
Pels Type IS-23, Capacity 2" Rd., 1¾" Sq.

**SHEAR—BILLET**
No. 7 Hilles & Jones, Motor Drive, Cap. 5" Sq.

**SHEARS—GATE**
80" x ¾" Pels
86" x 1" Hilles & Jones

**SHEAR—ANGLE**
6 x 6 x ⅝" Cleveland

**SHEARS—SQUARING**
12' x 3/16" Cincinnati #1412
12' x ⅜" Niagara, NEW 1951
12' x ⅜" Steelweld

**SLITTERS**
36" Yoder Slitting Line
G-48 Yoder Gang Slitter, 5" Threaded Arbor

**STRAIGHTENERS**
Kane & Roach 2 Roll Rotary Straightener, M.D. Capacity Mildsteel ⅛" to ⅜"
Aetna Standard 12 Roll Straightener. Capacity 2"

**TESTING MACHINES**
60,000, 100,000, 200,000 Olsen & Riehle Universal
50,000 and 300,000 lb. Compression

**WIRE DRAWING MACHINE**
Synero BCS 14 Die Wire Drawing Machine with Spooler & Blocks. Entering Size Max. .105", Finish Min. .0104" low carbon steel

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• Manufacturing

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## RE-NU-BILT
***GUARANTEED***
## ELECTRIC POWER EQUIPMENT

### D. C. MOTORS

| Qu. | H.P. | Make | Type | Volts | RPM |
|---|---|---|---|---|---|
| 1 | 2200 | G.E. | MCF | 600 | 400/500 |
| 1 | 1200 | G.E. | MCF | 600 | 650/800 |
| 1 | 1600 | G.E. | MCF | 600 | 350/700 |
| 1 | 940 | Whse. | QM | 250 | 140/170 |
| 1 | 800 | Whse. | | 250 | 450/550 |
| 1 | 500 | Whse. | CC-316 | 600 | 300/900 |
| 1 | 500 | G.E. | MCF | 230 | 250/750 |
| 3 | 450 | Whse. | | 550 | 415 |
| 1 | 250 | G.E. | MPC | 230 | 400/600 |
| 1 | 200 | G.E. | CD-1652Z | 230 | 500/1500 |
| 1 | 200 | Whse. | CB-5113 | 250 | 400/800 |
| 1 | 150 | G.E. | | 600 | 250/750 |
| 1 | 150 | Cr. Wh. | 65H | 230 | 1150 |
| 2 | 150 | Cr. Wh. | 83H-TEFC | 230 | 890 |
| 1 | 150 | Whse. | 8K-151B | 230 | 900/1800 |
| 1 | 150 | Whse. | 8K-201 | 230 | 360/950 |
| 1 | 120 | G.E. | MCF | 230 | 250/1000 |
| 1 | 125 | Whse. | 8K-183 | 230 | 850 |
| 8 | 100 | Rel. | 1050T | 230 | 400/1200 |
| 2 | 100 | Whse. | 8K-181 | 230 | 450/1000 |
| 2 | 75 | C.W. | 53H-TEFC | 230 | 860 |
| 1 | 50 | G.E. | MD-412AE | 230 | 850 |

### *M-G Sets—3 Ph. 60 Cy.*

| Qu. | K.W. | Make | RPM | D.C. Volts | A.C. Volts |
|---|---|---|---|---|---|
| 1 | 3000(3U) | G.E. | 514 | 600 | 4000/6900/13200 |
| 2 | 2000/2400 | G.E. | 450 | 250/300 | 2300/4600 |
| 1 | 1750/2100 | G.E. | 514 | 250/300 | 2300/4600 |
| 1 | 2000 | G.E. | 500 25cy | 660 | 11000 |
| 1 | 2000 | G.E. | 514 | 600 | 2300/4600 |
| 1 | 1500 | G.E. | 720 | 600 | 6600/13200 |
| 1 | 1250 | Whse. | 720 | 600 | 2300 |
| 1 | 750 | Whse. | 900 | 250 | 2300/4000 |
| 1 | 500 | Whse. | 900 | 125/250 | 440 |
| 1 | 200 | Whse. | 1200 | 250 | 440 |

### TRANSFORMERS

| Qu. | KVA | Make | Type | Ph. | Voltages |
|---|---|---|---|---|---|
| 3 | 1000 | G.E. | HVDDJ | 1 | 2400x480 |
| 6 | 1000 | Wagner | OISC | 1 | 13200x460 |
| 3 | 667 | G.E. | HD | 1 | 13800x2300 |
| 3 | 500 | Kuhl | OISC | 1 | 13200x6600 |
| 3 | 333 | G.E. | HS | 1 | 7200x2400/4160Y |
| 3 | 333 | G.E. | HD | 1 | 13200x2300 |
| 3 | 333 | G.E. | HSWB | 1 | 2300/4000x230/460 |
| 1 | 300 | G.E. | HT | 3 | 4160x480/277 |
| 3 | 250 | Penn. | DISC | 1 | 34500x120/240 |
| 3 | 200 | Whse. | OISC | 1 | 13200x120/240 |
| 3 | 200 | G.E. | HKS | 1 | 4800/2400x230/460 |
| 1 | 150 | G.E. | HT | 3 | 27060x125/216 |

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## SELECT MACHINE TOOLS

**GRINDING MACHINES**
72" Hanchett 3-spd. rotary surface, new 1946.
13" x 60" Model 300 Hanchett vert. spdl., late.
14" x 36" Pratt & Whitney hyd. vert. surface, 1942.
30" No. 18 Blanchard rotary surface, new 1941.
No. 72A5 Heald hyd. pl. internal, extended bridge, 1943.
No. 74 Heald hyd. pl. internal, X-sliding H.S., 1941.
No. 72A3 Heald hyd. pl. internal, X-sliding H.S., 1941.
12" x 24" Cincinnati ER hyd. universal cyl., 2U3BIH-5.
14" x 36" Landis type C hyd. pl. cylindrical, 1942.
6" x 30" Cincinnati EA Filmatic pl. cylindrical, 1942.

**HAMMERS**
No. 0-1 Nazel, pneumatic, late
No. 5N Nazel, self-contained.
No. 6B Nazel, self-contained.

**LATHES**
No. 3 Gisholt Univ. Turret Lathes (2), 1942.
24" x 8' LeBlond H. D. engine lathe.
14" x 6' Hendey Toolroom, 1940.
15" x 30" Lipe Carbo-Matic, 1942.
128" x 96' CC Niles Bement Pond engine lathe, 80 HP M.D.
90" swing Betts Bridgeford H.D. engine lathe, late.

**PLANERS**
36" Rockford Hyd. Openside Shaper-Planer.
42" x 42" x 12' Liberty dbl. housing planer, 35 HP M.D.
48" x 48" x 10' Gray Maxi-Service.

**PRESSES**
90 ton No. 92½C Toledo D.C. Str. Side.
250 ton No. 795½-72 Toledo D.C. Toggle drawing.
500 ton No. 1039 Hamilton D.C. adj. bed, 60" x 102".
2000 ton No. 6 National Maxidress Forging Press.

**SHAPERS & SLOTTERS**
24" Gould & Eberhardt Universal.
32" G & E Invincible, F.M.D., late type.
36" Rockford openside hyd. shaper-planer, ser. 39HU35.
36" Rockford hyd. vertical slotter, new 1944.

**UPSETTERS**
3½" Ajax suspended slides, steel frame.
1½" National Upsetter, guided ram, hard ways.
2" National Upsetter, guided ram, air clutch.

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### MOTOR GENERATOR SETS

| Qu. | KW | Make | R.P.M. | D.C. Volts | A.C. Volts |
|---|---|---|---|---|---|
| 1 | 2500 | Whse. | 720 | 600 | 4160/2300 |
| 1 | 2000 | Al. Ch. | 720 | 250 | 4160/2300 |
| 1 | 1200 | Whse. | 720 | 600 | 2300 |
| 1 | 1120 | Elliott | 720 | 260/280 | 2300 |
| 1 | 500 | G.E. | 1200 | 250 | 2300/440 |
| 1 | 500 | Cr. Wh. | 720 | 575/600 | 2300/440 |
| 1 | 300 | G.E. | 1200 | 250/275 | 2300 |
| 1 | 200 | Elliott | 1200 | 125 | 4000/2300 |
| 3 | 150 | G.E. | 1200 | 250 | 2300/440 |
| 1 | 120 | Whse. | 1200 | 250 | 2300/440 |
| 1 | 100 | Al. Ch. | 1200 | 250 | 4000/2300 |

### LARGE MILL TYPE MOTORS

| Qu. | HP | Make | R.P.M. | Volts | Type |
|---|---|---|---|---|---|
| 1 | 3000 | Whse. | 600 | 525 | Tandem |
| 1 | 1500 | Whse. | 600 | 525 | Rev. |
| 1 | 700 | Al. Ch. | 135 | 230 | Mill |
| 2 | 600 | Al. Ch. | 300/600 | 600 | Mill |
| 2 | 600 | Whse. | 110/220 | 230 | Mill |
| 1 | 450 | Whse. | 450/600 | 230 | 8K |
| 1 | 300 | Whse. | 300 | 230 | Mill |
| 4 | 275 | Whse. | 425/850 | 230 | QM-660.6 |
| 1 | 150 | Whse. | 360/720 | 600 | QM-666.3 |

### SLIP RING MOTORS
**Constant Duty 3 Phase 60 Cycle**

| Qu. | HP | R.P.M. | Make | Type | Volts |
|---|---|---|---|---|---|
| 1 | 100 | 430 | Al.Ch. | | 440/220 |
| 2 | 100 | 495 | G.E. | 1-15A-M | 2300 |
| 1 | 100 | 900 | El. Dy. | | 2300 |
| 1 | 100 | 1200 | Whse. | CW | 440/220 |
| 1 | 104 | 870 | Whse. | CW | 440/220 |
| 1 | 125 | 600 | G.E. | 1-14-M | 2200 |
| 1 | 150 | 450 | Whse. | CW-1000 | 440 |
| 1 | 150 | 490 | Whse. | CW | 440/220 |
| 1 | 150 | 585 | Whse. | CW | 4160/2200 |
| 1 | 150 | 720 | Al. Ch. | ARY | 440/220 |
| 1 | 200 | 435 | G.E. | I-M | 440 |
| 1 | 200 | 490 | G.E. | I-14-M | 2200 |
| 2 | 200 | 585 | G.E. | I-12-M | 2200 |
| 1 | 250 | 300 | G.E. | MT-414 | 2200 |
| 1 | 250 | 720 | Al. Ch. | ARY | 440 |
| 1 | 350 | 360 | Whse. | CW | 2300 |
| 1 | 400 | 360 | G.E. | MT-424 | 2300/440 |
| 1 | 400 | 505 | Al. Ch. | ARY | 2200 |
| 1 | 425 | 392 | G.E. | I-M | 440 |
| 1 | 450 | 440 | Whse. | CW | 2200 |
| 1 | 450 | 514 | G.E. | I-M | 2200 |
| 1 | 500 | 450 | G.E. | I-M | 2300 |
| 1 | 500 | 514 | Al. Ch. | ANY | 2200 |
| 1 | 700 | 295 | Whse. | CW | 2300 |
| 1 | 750 | 400 | G.E. | I-M | 2200 |
| 1 | 1000 | 445 | Whse. | CW | 2300 |
| 1 | 1250 | 593 | Whse. | CW | 6600 |
| 1 | 1500 | 360 | G.E. | MT | 2300 |
| 1 | 1800 | 270 | Whse. | Mill type | 6600 |
| 1 | 2500 | 257 | G.E. | Mill type | 6600 |

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Gleason 3" Str. Bevel Gear Generators.
K & T No. 3B Plain, vert. attach. MIB.

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1—35"—3-Hi Blooming Mill, complete with Pinion Stand, Gear Reducer, 2500 H.P. AC Motor, Lift Tables, and Bloom Shear.

1—24" Bar Mill, 2 Stands, One 3-Hi and One 2-Hi, complete with Pinion Stand, Gear Reducer, 2500 H.P. AC Motor, Lift Tables, Transfer Tables, and Shear.

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1—2000 H.P. G.E. Slip Ring Motor, 237 RPM, 2300/3/60, Mill Type, complete with Controls and Forced Air Cooling System.

1—2000 H.P. Mesta Gear Reducer, Ratio 10 to 1.

1—McKay 17-Roll Leveller—3" diameter x 24" Rolls, Enclosed Gearing, Universal Spindles, Inverted Screw-down.

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1—34" x 144" Roll Grinder, Farrel-Birmingham, complete with Crowning Attachment.

1—United 26" Vertical Sheet Bar Shear, complete with Tables, Gauge, and Electrics.

1—12" x 3/16" Stamco Power Shear, complete with Holddown.

1—#55 Hendley & Whitmore Combination Punch and Shear.

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4" National Upsetter High Duty, guided overarm slide, air clutch

Ajax & National Upsetters, suspended slide, 2½", 3", 4"; similar upsetters not suspended slide, ¾", 1", 1½", 2", 3"

5" Acme Upsetting & Forging Machines suspended slide, cam side die slide

700-ton Ajax High Speed Forging Press

50,000# Standard Double Draw Bench

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10' x ½" Plate Shear, Long & Allstatter 10" throat, M.D. Rebuilt

10' x 1" Long & Allstatter Plate Shear

Hilles & Jones and Buffalo Shears 1½", 2", 2½", 3", 3¼", 4" and 4¼"

1600 & 2750# Chambersburg Model F Board Drop Hammers, Roller bearing; double V-ways, Built 1943

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24"::276" LANDIS Type "B" Hydraulic Plain Cylindrical Grinder.

2H, 2K & 3H K & T Plain & Vertical Millers.

16"x16"x48" THOMPSON Type "C" Hydraulic Surface Grinder.

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### Industrial Heat Treat Furnaces

G.E. ROLLER HEARTH 465 KW, 1650 deg. F, 5' wide, 18" high, 20' long & 40' cooling.

G.E. ROLLER HEARTH gas fired, rad. tube. 5' wide, 18" high, 18' long & 40' cooling.

G.E. PUSHER 240 KW, 1650 deg. F, 4' wide, 12" high, 22' long, quench conveyor.

4000 CFH. EXO GEN. w/each above furn.

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500 C.F.H. Westinghouse Endothermic Gen.

HOLCROFT, GAS RECIRC. DRAW. 36" belt, 12" high, 24' long, 1250 deg. F.

2000 ft. Mechanical Handling System No. 458 Chain with trolley & clevice assemblies.

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300 KW G. E. High Speed 3.6:1.
150 HP Fawcus 11.7:1 Mill Type.
125 HP Far. Bir. 4.72:1. Heavy Duty.
3 HP DO James 85.75:1, Planetary.
60 HP Varipitch Al. Chai. 870:500/1500.

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## Overhead Cranes & Hoists
### New and Used

10 Ton Cleveland Crane, 45'0" span, 230 VDC with motor generator set. Cage Controlled.
5-ton P & H crane, 3-motor, 45'0" span, 220 vo. 3 ph. 60 cy. cage operated.
100 Other Cranes, various spans, tonnages and current.

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2—500 KW General Electric Synchronous Motor Generator Sets

Generators; type MPC, 240 Volts D.C. 900 RPM, 40 degree

Synchronous Motors: 725 HP, 830 KVA, 3 PH 60 Cycle 2200 Volts. Equipment: D.C. Panels and C R 7069Y1

Synchronous Motor Panels

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5" Bar #45 Giddings & Lewis Horizontal Table Type Boring Mill Serial #18151.

3" Bar Tri-Way Universal Boring Mill Serial T2430.

2-3-4 Spindle Leland Gifford Drills.

#300 Hanchett Vertical Surface Grinder Ser. #300-17 capacity 13" x 72".

(1) 24' x 8' x 10" Thick T Slotted Floor Plate.

3V Van Norman Vertical Miller—Late.

30" x 120" Hanchett Horizontal Spindle Plano Surface Grinder Late Type Serial OS-13.

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| 100 CFM | 150 PSI | 6 x 7 Ing. ES-NL |
| 138 CFM | 100 PSI | 7 x 7 Ing. ES |
| 173 CFM | 100 PSI | 9 x 8 Ing. ER—Chicago NSB |
| 180 CFM | 60 PSI | 8 x 7 Ing. ES—NL |
| 219 CFM | 1200 PSI | Ing. Rand ES—3 |
| 234 CFM | 100 PSI | 9 x 9 Worth. HB |
| 250 CFM | 400 PSI | 10-4½ x 10 Chicago NCTB |
| 254 CFM | 115 PSI | 10 x 10 Ing. ER |
| 290 CFM | 75 PSI | 10 x 9 Ing. ES |
| 283 CFM | 35 PSI | 10 x 7 Ing. ES |
| 470 CFM | 100 PSI | 13-9 x 10 Ing. XRB |
| 676 CFM | 100 PSI | 15-9¾ x 12 Ing. XRB |
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| 100 | G.E. | MPC | 400/800 |
| 100 | G.E. | RC-34 | 2500 |
| 100 | G.E. | RC-19 | 575 |
| 100/150 | G.E. | MCF | 380/1000 |
| 50 | Cr. Wh. | CMC | 700/1100 |
| 50 | G.E. | DLC-204 | 650 |
| 35 | Westg. | SK-150 | 350/1000 |
| 30 | Cr. Wh. | CCM-504 | 450 |
| 30/40 | G.E. | CD-115 | 500/1500 |
| 25 | G.E. | RC-32 | 800 |
| 25 | Westg. | SK-133 | 575 |
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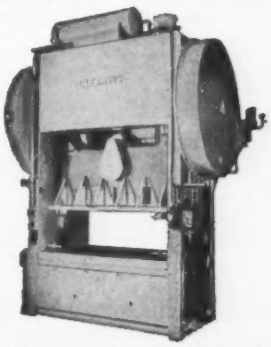

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**Canterbury Engineering & Precision Works Ltd.**
**Wincheap, Canterbury, Kent.**

## METALWORKING BRIEFS

### Strike Hits Southern Fabricators

The railroad strike at Tennessee Coal & Iron Div. of U. S. Steel Corp. is exacting a toll of fabricated steel production and employment in the area. In addition to the 25,000 idle at TCI, some 2000-3000 have been laid off in customer plants. Walkout began three weeks ago over transport workers' demands for higher wages and improved fringe benefits.

### Fringe Benefits Are Costly to Industry

A study by the Bureau of Labor Statistics indicates that fringe benefits cost the average firm employing less than 100 workers, some 10 pct of total payroll. For larger companies, the average is 13 pct. The extreme, according to BLS, is 20 pct of total payroll. Averages seem to work out the same whether company is under union contract or not.

### H. K. Porter Makes Changes At Disston Div.

H. K. Porter Co. has transferred tool steel operations of its newly-acquired Disston Div. to the Vulcan Crucible Steel Div. at Aliquippa, Pa. Armor plate department at Disston has been discontinued.

### Westinghouse Expansion-Minded On Appliances

Westinghouse Electric Corp. plans to "substantially" increase production of automatic washers, dryers, and portable appliances at its Mansfield, O., plant during next two or three years. To facilitate this expansion, production facilities for electric dish washers will be moved from Mansfield to new appliance plant at Columbus in next few months.

### Industrial Furnace Business Booming

Orders for industrial furnace equipment are running 50 pct ahead of last year, which set a new peacetime record. Industrial Heating Equipment Assn. says orders through April totaled $38.2 million, compared with $25.6 million in the same period last year.

### Europe Expands Coal, Steel Capacity

European Coal & Steel Community reveals that between $3 and $3.3 billion has been invested in the two industries in 1953-55. Another $1 billion will be spent this year.

### Government Smelter Wins Reprieve

Government will continue to operate the big tin smelter at Texas City, Tex., at least until Feb. 1, 1957. Congress agreed to postpone shutdown scheduled for June 30 until negotiations with prospective buyers are wrapped up.

## ADVERTISERS

**An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.**


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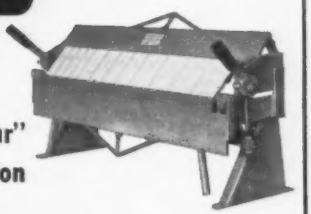

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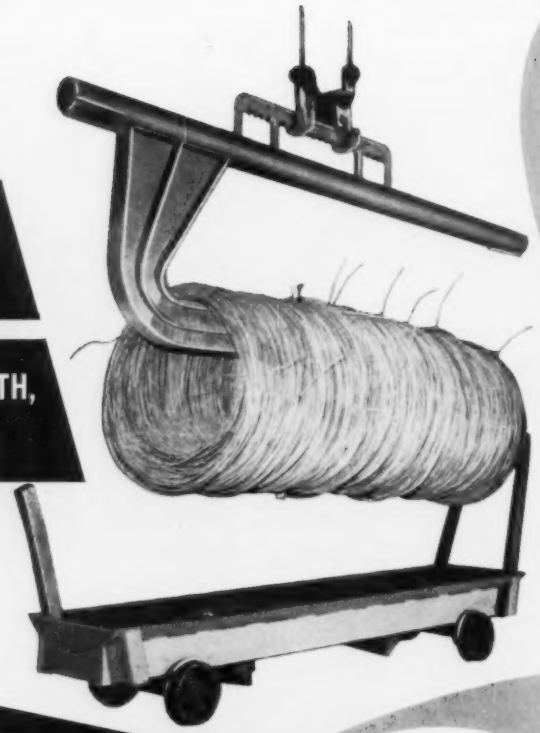

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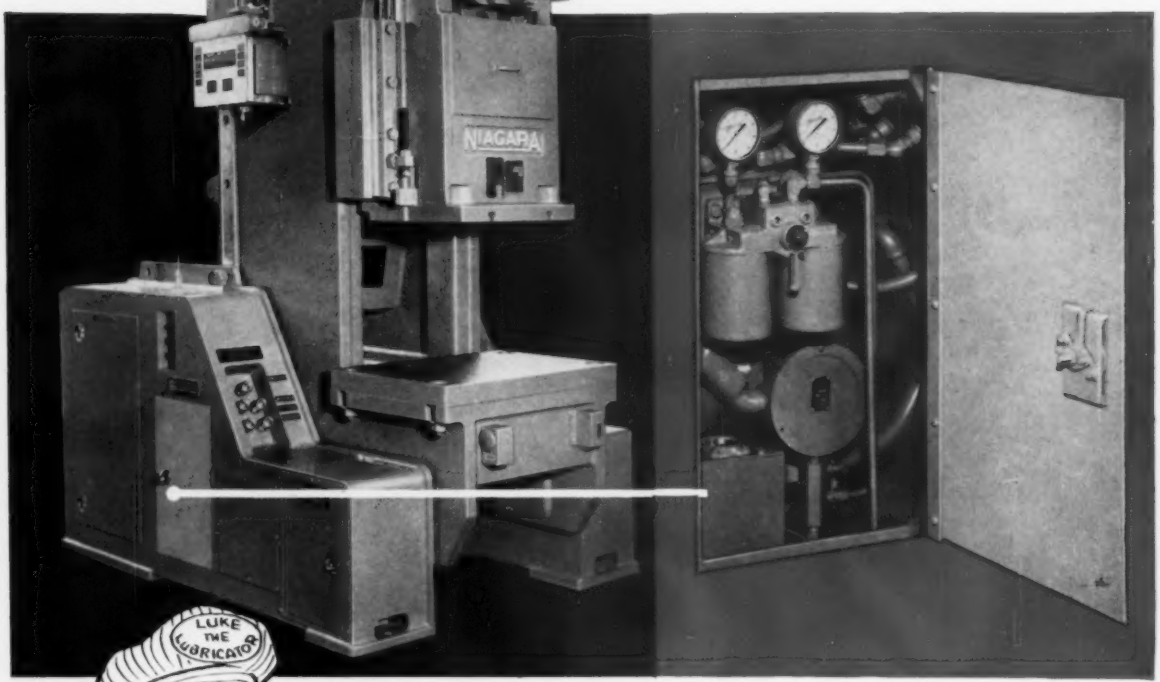

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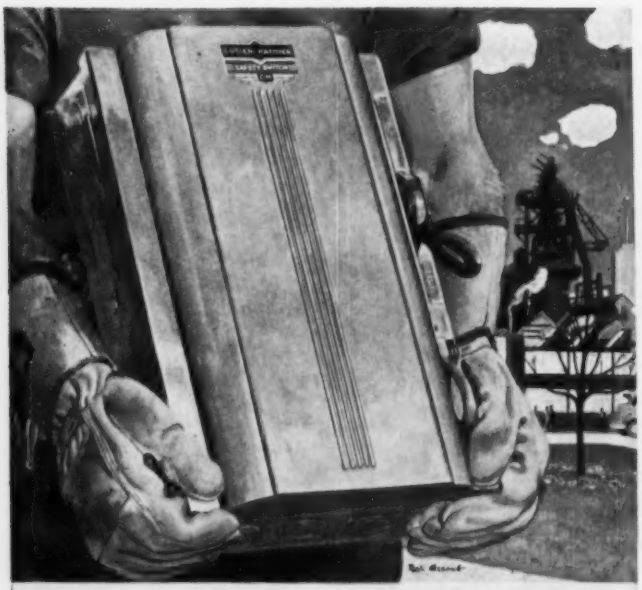

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